Introduction to

EXCEPTIONAL CHILDREN

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Introduction to EXCEPTIONAL CHILDREN

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Introduction to
EXCEPTIONAL CHILDREN

REVISED EDITION

By HARRY J. BAKER, PH.D.
Director, Psychological Clinic, Detroit Public Schools

THE MACMILLAN COMPANY · NEW YORK

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Foreword

It is commonplace for speakers and writers to use the expression, "these are unusual times," but when the clear, cold light of history is brought to play upon the events of today, there will be little doubt that our times are as critical as any through which the civilized world has ever passed. Upon our ability as teachers of the exceptional to analyze accurately the present situation and to act accordingly depends the fate of thousands. In the tasks that lie ahead those of us working with the exceptional have a most significant role to play. We have much to contribute. In discovering and in carrying out this role we must, I feel, be a most intimate part of education as a whole and must keep tuned-in continuously on the jobs that face educators everywhere in our country.

The emergency which is upon us in reality constitutes the greatest opportunity teachers of the exceptional have ever had, regret as we do that it must come this way. Fortunately, many of the places of the millions called to the armed forces and to war production are being most capably filled by persons in various groups of the handicapped. Many more can be employed if we, as teachers, have the insight, ability and energy to give them the timely assistance they need. As I see it, this assistance must be of three types.

a. Guidance and instruction in the techniques and understandings required for the different jobs. These jobs range from simple tasks, such as manual labor and the operating of certain power machines and non-intricate machinery, many of which can be handled by various types of the handicapped, to the most difficult and complicated tasks in organization and planning such as could be filled by the most gifted of our handicapped.

b. Sympathetic but realistic building of morale which will help each person to adjust to the changes that war, and the peace that follows, make inevitable, particularly by helping each to realize that now the country needs his contributions. Unfortunately, up to the present time the handicapped through no fault of their own have had too much practice in accepting rather than in giving service. This is a long and intricate job that must be done with painstaking care and with the broadest kind of human understanding.

c. Exerting extraordinary effort in properly placing and following up each of the handicapped in jobs where they can continue to be of service to their country and to themselves.

If, following the shooting war, all of us in America together with our Allies, can have the combined wisdom to plan and carry through the kind of long range program that will enable those of the armed services and the war workers to find appropriate jobs in areas connected with the raising of standards of living for all people—including better health, housing, food, clothing and cultural and recreational opportunities for all—the handicapped could continue in the jobs they would have held so capably during the shooting war period. Thus many of them could become assets rather than burdens to society, in addition to having that deep and deserved personal satisfaction that comes to those who feel they are doing a part of the world's work.

To accomplish these aims will take the best our teachers have and will call for additional education on the part of most of us. The materials provided in Dr. Baker's *Introduction to Exceptional Children* serve ideally as a basis for such education. Whole-hearted desire and high purpose will avail us nothing unless the information which will provide the needed understanding of the exceptional is at hand. This information collected by Dr. Baker through years of scholarly research and rich experience is now made available in the following pages. In my judgment, it is a most timely contribution and constitutes "must" reading not only for students, teachers, and administrators who deal directly with the exceptional, but for all those educators and other citizens who are interested in a sounder educational program for those who are not so fortunate and in the educational well being of our country generally.

HERBERT B. BRUNER

Oklahoma City, Oklahoma

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Preface to the Revised Edition

It has been nearly a decade since the first edition of this book was published. Since that time education has moved from a wartime era to a peacetime period with its re-direction of emphasis to the education and welfare of children rather than to their political protection alone. During the course of both World Wars the necessary evaluation of the young men and women of the country disclosed many physical, mental, and emotional defects which could be traced back into childhood and adolescence. The staffs of the armed forces who evaluated and serviced the military personnel with these defects resumed their civilian duties and again devoted their attention to similar defects and disabilities in children. As a result there was renewed interest in all types of handicapped and exceptional children.

Programs for handicapped and exceptional children have been promoted along many lines. Members of the medical profession were able to apply many new techniques learned from their military experiences. School systems reflected the new trend with increased facilities for diagnosis and for special education classes and schools. Teacher training colleges established introductory courses as well as complete curriculums for the training of teachers specializing in various types of exceptional children. Many state governments provided special state aid to encourage local communities t[illegible]elop and to expand their facilities for exceptional childr

The first edition of this book appeared at a tim assist in this revival of interest in exceptional chil enjoyed wide use as a textbook and source of teacher training. School administrators and teac found it to be a practical reference in unde various types of exceptional children. It has also been of substantial service to clinical and diagnostic agencies in the interpretation of the complex problems which characterize many of the exceptional. It has been published in a Spanish edition in Argentina.

The task of revision has by no means been a simple one. In order to give an up-to-date account of progress in the many fields, the new sources of research and of publications by specialists and authorities have been reviewed, and the trends of their thinking have been noted. Many leaders in the various fields have been consulted personally to learn of their views as to the unique adaptations necessary for the various types of handicaps. Much of the periodical literature in medical, educational, and psychological areas dealing with exceptional children has been consulted. In order to reduce the expense of publication the format of the first edition has been preserved as far as possible.

Special appreciation is acknowledged to my wife, Mrs. Hazel Baker, for her invaluable help in the preparation of source material and other tasks necessary in editing the revised edition.

HARRY J. BAKER

Preface to the First Edition

This book is an introduction to exceptional children. It is intended primarily for use in an introductory course for college and university students. For teachers who expect to specialize in some field of exceptional children, it is designed to give an over-all view of the entire field. It is also recommended as a text for teachers of regular classes who should pursue at least one introductory course in this field in order to recognize potential candidates for various types of special classes and for a better understanding of what programs such classes offer for exceptional children.

It is intended also as a reference book for school administrators, supervisors, principals, teachers in service, and for physicians, psychologists, social workers, and others who deal with exceptional children. It is desirable that all such groups shall have some understanding of the nature of these children and what an effective educational program for them should contain.

A beginning study of any type of the handicapped or exceptional discloses a wealth of literature in all the fields. In the preparation of the present book a vast amount of material was available, enough to write several volumes about each type of the handicapped. There has been a conscientious attempt to condense the main facts into a length which is not too cumbersome and, at the time, complete enough to give a reasonably thorough résumé of the pertinent information and the chief issues. Under the Questions and Topics for Discussion at the end of each chapter and in the List of Referenc at the end of each part, many sources are suggested whi open the various fields to unlimited study and research.

Some types of exceptional children are discussed for w no special classes or schools are provided, but whose problems are worthy of presentation both for regular and for special teachers. Among them are the rapid-learning, the slow-learning, the glandular, the left-handed, multiple-birth children, and several others. This book is intended to present the characteristics and problems of all types of exceptional children rather than to give a complete description of special education suited to their needs. Such materials follow in advanced courses for those who intend to specialize in such teaching.

There has been a serious attempt to limit the topics of discussion to a few of the most informative and crucial areas. These include definitions, personality and mental characteristics, the number of cases, problems of formal and informal diagnosis, causes, remedies and preventions, history of the development, and a brief sketch of special classes or schools.

Three types of reference material are presented at the end of each part of the book as follows: a list of important references, organizations or associations, and periodicals.

In the preparation of this book, the author is indebted to many writers and their investigations in a variety of fields. Grateful acknowledgment is made to the staff of the Detroit Psychological Clinic working under his direction whose diagnostic work over a period of many years, with cases representing every type of the handicapped and exceptional, has been in invaluable aid to vital first-hand information. Special thanks are also due to Miss Alice B. Metzner, Director of Special Education in the Detroit Public Schools, and to her supervisory and administrative staff; also to the teachers of special classes in providing a wealth of practical material from the program of special education in Detroit. To Dr. John J. Lee, Director of Teacher Training for Special Education at Wayne University, for reading portions of the manuscript and for permission to make generous use of his studies of crippled children.

HARRY J. BAKER

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Part I

Introduction to the Field

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Chapter I

PROBLEMS IN GENERAL EDUCATION

The principal theme of this book is that exceptional children are fundamentally similar to normal children. The exceptional differ from the normal mainly in degree, depending upon the severity of the defect or deviation. It is logical, therefore, that a discussion of the exceptional should be introduced by a brief consideration of problems and issues in the field of general education. This first chapter is concerned with the aims and objectives of education, school organization, curriculum, the selection and training of teachers, and similar problems. It will be followed by a second chapter dealing with special applications of these general problems to exceptional children. Without this type of introduction and continual reference to it, either directly or by inference, the education of exceptional children becomes a thing apart, foreign, and unrelated to the education of all children.

Education and Democracy

The colonization of America by the oppressed peoples of Europe was motivated by a need and impulse to freedom which eventually developed into the present democracy. This democratic way of life was paralleled by the concept that only through universal education could such a democracy be developed and preserved since all of the people must be intelligently informed and able to participate. Although education itself was left mainly to the states, the national government has always encouraged a program of education. In Article III of the Ordinance of 1787 it was declared that: "Religion, morality and knowledge being necessary to good government and the happiness of mankind, schools and the means of education shall forever be encouraged."

Education has always been related to the ways of life so that changes in the latter bring changes in the former. The early American needs for education were confined mainly to the three R's as a means of carrying on simple transactions in the program of rural life. With the rapid development of a complex urban life, modern inventions, and the shift from individual ownership of farms and small business to employment in large industries, education has taken on much more important, complicated, and far-reaching aims, methods, techniques, and procedures.

In this complexity of modern life there is always the challenge that education shall not lag behind society and merely propagate what society has already experienced. It must not only interpret the past and relate it to the present but set goals and ideals for the future as well. Just how effectively education has been able to perform this most important function is still a matter of difference of opinion. How well it is adjusted to the needs of exceptional children in this modern setting is a still greater problem.

There has always been a strong belief that education has profound effects upon the development of society and government. In fact there is plenty of proof throughout the years of American history that such results have been obtained. In certain other countries education has been used as a dangerous but effective tool to foster philosophies of government and ways of life quite different from those accepted in America and other democratic countries. In an article, "Education under the Nazis," Beard[1] states "Decree after decree shows that it is . . . openly hostile to every manifestation of free inquiry and discussion in the schools from the bottom to the top. The subjects to be taught, the books admitted to schoolrooms, the papers and magazines bought for libraries, and the very spirit of instruction are prescribed in minute detail. No room is left for private opinion." What has just been quoted is a cause for sober thought by educators in a democracy. The peoples' obvious responsibility is to chart the course of democracy clearly, and education must put it into practical and effective operation. There is evidence that education has proved to be the effective agent for carrying out what is wanted even by dictators in totalitarian countries.

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[1] C. A. Beard, "Education under the Nazis," *Foreign Affairs*, 1936, 14, pp. 437–452.

Trends in American Philosophy

There are three main trends in American philosophy which furnish the background for education, as summarized by Taylor.[1] The first of these is naturalism and instrumentalism, ① based on science, with a central emphasis which is empirical, and which reflects the thinking of William James and John Dewey. The second trend is rationalism which seeks to apprehend ② universal truths from the Greek philosophy of Aristotle and the medieval period of St. Thomas. The third philosophical ③ trend is to analytical philosophy, which embodies a theory of knowledge, the analysis of propositions, and the reduction of meaning to symbols and to logical forms. Since these schools of philosophical thought represent quite widely differing ideas, and since each of them seeks to control educational trends, there is some confusion in the basic foundations of education. The problem of a sound philosophy becomes more complex when dealing with the education of exceptional children.

Some Statements of Objectives

There have been many excellent attempts at stating the objectives of education. Many authors were puzzled and confused about how to isolate specific factors or issues independently of each other since life itself is complex. Education and life should be synonymous enough so that the objectives of one are the objectives of the other.

In the search for specific educational objectives, areas of human activity have been minutely subdivided. Frederick and

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[1] H. Taylor, "General Education," *Fifty-first Yearbook, Part I,* National Society for the Study of Education, The University of Chicago Press, Chicago, 1952, pp. 20–45.

Farquear[1] made a survey of educational objectives and tabulated 44 classifications with a total of 349 areas listed. Any list which attempts to divide objectives into too many areas becomes cumbersome, whereas one that is too simple and brief may be so general that it lacks useful, specific force. A middle ground between these two extremes offers the most practical type of objectives.

1861 Herbert Spencer

In 1861 Herbert Spencer[2] offered a practical fivefold classification of human activities as a basis of educational objectives:

(1) self-preservation
(2) securing the necessities of life
(3) the rearing and discipline of offspring
(4) the maintenance of proper social and political relations, and
(5) the activities which make up the leisure part of life, devoted to the gratification of the tastes and feelings.

1918 "7" Cardinal Principles

A widely quoted list of aims was contained in the 1918 Report of the Commission of Reorganization of Secondary Education of the National Education Association.[3] These aims were known as the seven cardinal principles of education and are as follows: (1) health, (2) command of the fundamental processes, (3) worthy home-membership, (4) vocation, (5) citizenship, (6) worthy use of leisure, and (7) ethical character. The Department of Superintendence of the National Education Association[4] in 1928 listed four areas of the curriculum related to the individual as: (1) to his own growth and development, (2) to the world of nature, (3) to the systems of organized society, and (4) to the Power which in some ways orders the development of man and his universe.

The most recent, comprehensive, yet brief statement of objectives was issued by the Educational Policies Commission of the National Education Association and the American Association of School Administrators in "The Purposes of Education in American Democracy."[1] They are ①self-realization, ②human relationships, ③economic efficiency, and ④civic responsibility. Each of these is related to each of the others in the total life of the individual and in the total educational program. Each of these four is capable of further subdivision, for example the objectives of self-realization are as follows:

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[1] O. I. Frederick and L. J. Farquear, "Problems of Life," I and II, *School Review*, 1938, **46**, pp. 337–345 and pp. 415–422.

[2] H. Spencer, *Education*, D. Appleton-Century Company, Inc., New York, 1861, p. 32.

[3] U. S. Department of the Interior, Bureau of Education, *Cardinal Principles of Secondary Education*, Government Printing Office, Washington, D. C., 1918, p. 32.

[4] National Education Association, Department of Superintendence, *The Development of the High School Curriculum*, Sixth Yearbook, The Department, Washington, D. C., 1928, pp. 51–56.

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THE OBJECTIVES OF SELF-REALIZATION[2]

The Inquiring Mind. The educated person has an appetite for learning.

Speech. The educated person can speak the mother tongue clearly.

Reading. The educated person reads the mother tongue efficiently.

Writing. The educated person writes the mother tongue effectively.

Number. The educated person solves his problem of counting and calculating.

Sight and Hearing. The educated person is skilled in listening and observing.

Health Knowledge. The educated person understands the basic facts concerning health and disease.

Health Habits. The educated person protects his own health and that of his dependents.

Public Health. The educated person works to improve the health of the community.

Recreation. The educated person is participant and spectator in many sports and other pastimes.

Intellectual Interest. The educated person has mental resources for the use of leisure.

Esthetic Interests. The educated person appreciates beauty.

Character. The educated person gives responsible direction to his own life.

It will be noted that many of the objectives of self-realization deal with topics which are intimately related to exceptional children. These relationships will be discussed somewhat further in the following chapter.

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[1] Educational Policies Commission, *The Purposes of Education in American Democracy*, National Education Association, Washington, D. C., 1938, 157 pp.

[2] Education Policies Commission, *ibid.*, p. 50. Quoted by permission.

The Nature of the Child

In many fundamental ways all children are alike. Whether they are considered normal or exceptional there is a large central core of similarity among all of them. The variations are mainly a matter of degree and hence likenesses rather than differences should be emphasized.

All children crave recognition, praise, and security. The very factors which make for success in normal children are the same for which handicapped children must strive but in greater degree. All children want to play, have need for proper food and shelter, may weep over the same things, suffer the same disappointments, and rejoice over the same successes. They develop from infants into children and then into adults, possibly at different rates, yet all seek to attain the same general goal of maturity. They have fears, worries, suffer from the same shock, ask the same questions about their origins, and in countless ways live similar patterns.

In any study of exceptional children the norm of the average child should constantly be kept in mind. Child psychology is always the basis of orientation in such projects. Most children grow up to accept the duties of citizenship, so that whatever preparation is merited by nonhandicapped children should also be provided for the handicapped in sufficient measure to help them achieve the same results.

Other Problems of General Education

There are many other problems in the field of general education besides the educational objectives. One of these is the development of the curriculum in all the different subjects, eliminating the obsolete and adding new subjects, allocating them to proper levels of age and interest. Important changes and revisions of the curriculum have been made in the past few years and there is evidence that it will change increasingly to anticipate the future as well as to portray the past. If it is granted that ideal and model curriculums have been developed for the general field of education, the means of adapting them to the needs of exceptional children is a distinct and baffling problem as will be shown later.

② Tchrs.

The selection and training of teachers have been increasing in importance in the past few years. In the final analysis the teacher is the most important single factor in the success or failure of education. All teacher-training institutions have been giving much more attention to the selection of prospective candidates and to the curriculums which they are offered. Suitability for placement no longer rests mainly upon the narrow basis of scholarship but also upon personality and character, social adaptability, professional outlook, and a comprehensive understanding of children.

③ org. of educ.

The organization of education has become a highly specialized problem in the past few years and promises to continue through various phases of change to adapt itself to the rapid changes in population trends and shifts. There are rural, town, city, county, state, and Federal systems of organization. All of these are designed for greater efficiency and for the allocation of responsibility to definite areas of administration. Problems of finance, taxation, and legislation are closely related to administrative organization and, in the case of exceptional children, offer very special and unique problems. Somewhat incidental to the main purposes of education but yet unavoidably important are such matters as the planning and construction of school buildings with all their accessories, equipment, and supplies.

④ auxil. services

In more recent years there has been a rapid growth of various types of auxiliary services dealing with pupil personnel, bureaus of research, departments of school attendance and child accounting, psychological clinics, health clinics, counseling, and placement. These services require closer cooperation between school and home as well as between school and the social agencies of the community. As the problems of exceptional children are considered in later chapters, it will be discovered how vital are all of these personnel and cooperating services in the total education program.

Modern education has found itself faced with many new and important problems, some of which have been briefly sketched in this chapter. All of them have special meaning with respect to exceptional children, and some of them have had their origins in the exceptional. As each type of exceptional child is to be discussed, their relationships are to be kept in mind. The truest conception of the exceptional is that they are fundamentally similar to regular or average children in many ways, and hence their education is closely related to that of average children.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Make a more detailed report on the types of objectives cited by Frederick and Farquear. (See footnote references.)
2. Make a further report on the objectives as outlined by the Educational Policies Commission.
3. List a few of the most important problems facing regular education. Which ones seem most critical to you?
4. List more of the emotional and social needs of the normal child than are cited in the text.

Chapter II

PROBLEMS OF EXCEPTIONAL CHILDREN

In the preceding chapter there was a listing of various problems and issues which confront the general field of education. Special emphasis was directed toward the aims and objectives of education. In this chapter this discussion will be continued with reference to exceptional children. Before such problems are discussed, it is necessary to give a brief description of exceptional children in order that it may be related to average or normal children.

Definitions of Exceptional Children

There is no single term which appropriately describes all the types of children to be discussed in this book. The term "exceptional" is probably the most suitable of several which might be selected. But even this term immediately gives the impression of something very unusual, outstanding, extraordinary, or rare, according to dictionary definitions. On the contrary it is the purpose to relate the education of exceptional children to normal, average children in logical and meaningful ways. One of the greatest obstacles to a better and more complete program of education for exceptional children arises from the widespread misconception that they are a class, separate and distinct from normal children. As a matter of fact, some exceptional children are characterized by handicaps so minor that they continue to be taught mainly in regular grades.

The types of exceptional children covered in this book embrace a much wider group of children than has usually been included by most authors and for two reasons: (1) to bridge a gap between the normal, average child and the extremely handicapped or exceptional, and (2) to interpret the needs of the mildly handicapped who are often more neglected and misunderstood than are those with more severe deviations.

"Exceptional" is a more inclusive term than "handicapped," since it embraces children at both extremes of various scales. This use is particularly true in the case of mental variations in which the mentally gifted are included. There should be a greater emphasis and development of the exceptional in the direction of talents of all kinds in addition to those disclosed by mental tests. The committee of the National Society for the Study of Education dealing with the education of exceptional children proposed the following definition: "Those who deviate from what is supposed to be average in physical, mental, emotional, or social characteristics to such an extent that they require special educational services in order to develop to their maximum capacity." [1]

Types of Exceptional Children

In the Table of Contents exceptional children are classified under five main divisions according to the types of handicaps or deviations. Any such classification is somewhat unsatisfactory since it does not convey a completely true impression of the problem. There is much overlapping between and among types of handicaps, and many children are afflicted with two or more defects. However, some type of classification with its admitted imperfections is probably better than none at all, and various exceptions will be taken up as the different types are discussed.

Part II includes several types of exceptional children whose handicaps are primarily physical, embracing defects of vision, hearing, crippling, lowered vitality, and others. Defective speech is placed in this group although some of the causes of defective speech are mainly psychological, while other causes are primarily physical, such as cleft palate.

Part III includes several types which are primarily psychological and ranging from the gifted to the feeble-minded.

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[1] National Society for the Study of Education, *Forty-ninth Yearbook, Part II,* University of Chicago Press, Chicago, 1950, p. 3.

They overlap into cases with physical handicaps, educational disability, and other areas.

Part IV covers cases with neurological and psychogenic diseases. Among these cases are classed the epileptics, the encephalitics, and children who are mentally ill or bordering on such illness. These types are often thought of incorrectly under the general caption of behavior maladjustments. When correctly treated their behavior is improved.

Part V deals with a very important and troublesome group under the general title of behavior problems. As these cases are discussed it will be seen that they have many causes which overlap into all of the other fields, physical handicaps, mental deviations, educational disability. For practical reasons in their treatment they are isolated as a distinct group, but they actually overlap into all other groups more widely than any other single type. In many ways they are the most baffling and cause the most difficulty of all types from an administrative as well as from a teaching point of view.

Part VI discusses children with educational disability. They are a very interesting and much worth-while group who are frequently omitted from any consideration among the exceptional. Potentially they are less handicapped than such groups as the blind, but on account of educational neglect they constitute a much greater educational loss to themselves and to society. Their difficulties may arise from a complex combination of causes—physical, psychological, emotional, social—but their possibilities of treatment and restoration to expected educational achievement are potentially great when treated with an understanding type of therapy.

At first sight this general overview and introduction to all types of exceptional children, may seem a little complicated. As each type is discussed and its specific characteristics are better understood its relationships to other types of exceptional children will become more evident. As a general plan, physical and mental deviations are to be presented first with their somewhat more distinct and clear-cut handicaps, while those with combinations of many handicaps follow more logically in later chapters.

Responsibilities and Interests

Any discussion of exceptional children must meet a variety of interests upon the part of teachers, supervisors, and administrators. New teachers who are specializing in the fields of the exceptional, and also regular teachers who wish to be better informed, will find the main points of discussion centered around their interests. They include the characteristics, the methods of diagnosis, causes, remedies, preventions, history of treatment, current problems in teaching, and allied topics. The supervisor and administrator must also be familiar with these topics so that they intelligently supervise and administer the program. They must have at least an active though minor interest in these same phases of exceptional children.

The major interests of administrators with regard to exceptional children lie in organization, curriculum, aims and objectives, teacher selection and training, finance and legislation, housing and equipment. For most effective results, teachers should have at least minor interests in such phases of the education of exceptional children so that they may more intelligently cooperate with administration and supervision. The supervisor must be informed in all phases, supervisory, administrative, and teaching, particularly in locations where their duties are also administrative. Since it would be impractical to give a detailed discussion of all phases of educating exceptional children, the major emphasis will be primarily toward that of the teachers' interests and secondarily toward administrative problems.

In Chap. I there was a discussion of problems and issues which concern the general field of education. Some of them will now be reviewed again with special reference to the exceptional, since they also apply to these fields as well as to the general field of education. The orientation of the exceptional should always be made in terms of the average or normal as a basis of general procedure. In the light of degree of handicap or deviation the effectiveness of educational results should be measured. This principle implies equal educational opportunity for all children, but adjusted to their strengths or weaknesses.

Aims and Objectives

According to the Educational Policies Commission, cited in Chap. I, the four main objectives of education are self-realization, human relationships, economic security, and civic responsibility. In the education of exceptional children it is an immediate challenge to meet and realize these objectives. Each of these merits some discussion and consideration with respect to exceptional children, each makes the problems of the exceptional more specific.

Self-realization. It is the general purpose of self-realization to reach the highest goal of self-efficiency of which the individual is capable. These steps include an inquiring mind, health, speech, sight and hearing, intellectual interest, and character. At once it is realized that exceptional children are deficient in some of these very tools with which to attain self-realization. Many are defective in sight or even totally blind, others are hard of hearing or totally deaf, others have speech defects, lowered vitality, limited mental processes, defects of character, and other handicaps. It is likewise recognized that the mentally exceptional or gifted possess many of these traits in unusual degrees and yet fail to utilize them at maximum efficiency. The challenge readily becomes clear that all remediable defects must be corrected, that the uncorrectable ones be utilized intelligently and effectively, and that, as far as possible, others be substituted and utilized in maximum ways. This first objective of self-realization implies the optimum use of normal physical and mental faculties, yet the very tools of self-realization themselves are faulty and inadequate. The real significance of an education suited to the needs and abilities of exceptional children becomes apparent in a very striking way.

Human relationships. This second objective meets some problems in the field of exceptional children. Friendship and cooperation are basic factors, but these are difficult to achieve if the individual cannot meet his associates upon an equal basis. He may be accepted in a charitable or apologetic way out of sympathy from his friends but he rejects this attitude as distasteful; or he may be rejected outright by an uncharitable and selfish world. The mentally retarded child cannot match wits against his more favored associates, the crippled child cannot take his place in the football game, the poor reader is not accepted among his classmates. They set up compensating barriers of aloofness, unsocial behavior, feelings of inferiority, and similar balances to offset their inadequate and unsatisfactory human relationships. Many of the things which are taken for granted in the normal, average child for the establishment of good human relationships must be nurtured and developed in exceptional children before they can be put to effective use. Yet the goal of human relationship is possibly of greater importance for the exceptional than for the average so that they may achieve the other objectives as well.

Economic efficiency. This objective includes satisfaction of good workmanship, wise occupational choice, good judgment in buying, and personal economics. These are all worthy objectives and difficult to achieve by more than one-half of the average population. It is doubly hard for the exceptional to achieve a sufficiently complete education to realize these objectives. The difficulties of wise occupational choice and adequate workmanship are well known in the fields of the handicapped, and yet they are very important and necessary if life is to be maintained on a level better than charity. With limited incomes and unusual expenses for health protection, wise personal economics far beyond that of the average person are necessary, yet they must be realized and achieved. These matters will be treated to some extent in discussions of various types of handicapped.

Civic responsibility. Civic responsibility includes social activity, social understanding, tolerance, political citizenship, devotion to democracy, and similar topics. Unless the first three objectives are realized without undue strain it is a very trying problem to accept one's civic responsibility with zeal, enthusiasm, and pleasure. It is only by the most understanding and judicious training that the exceptional are able to face life's problems from this point of view. Only a small percentage of the exceptional have any special recognition or special education at all, and those who do not are certainly faced with discouragement and possible defeat in civic responsibility. Some of them resign themselves to inevitable pessimism and discouragement, others actively rebel against society as is shown in their behavior and personality maladjustments even at an early age.

While these four objectives have been listed as worthy and highly desirable for the exceptional, as well as for the average or normal, a grave note of warning is sounded that they are inherently difficult to realize and to achieve for exceptional children. In facing these difficulties there is no suggestion of discouragement that such objectives cannot be realized, instead there is a fighting optimism that it can be done. The greater the task the greater is the challenge. Enough has been accomplished in many areas and with all different types of handicaps to point the way. The examples of many famous characters with the extreme handicaps of complete deafness, blindness, and other incapacities add to the proof that these objectives may be reached. At best the task must be faced soberly and its difficulties must not be minimized.

Curriculum Adjustments

In the midst of infinite numbers of changes in the modern dynamic curriculum, adaptations for the handicapped and exceptional must also keep pace. In the field of the blind, as much as possible that is suitable must be transcribed into Braille writing, but this is very costly and time-consuming. In handicaps where health requires a reduced educational program the problem of what may be abbreviated or entirely eliminated calls for good administrative judgment, coupled with thorough knowledge of subject matter. Additions and enrichments of the curriculum for the mentally rapid learners and the gifted likewise call for a high type of educational statesmanship. This entire problem of curriculum for the exceptional in many ways offers as great a challenge as the development of the general curriculum for all children.

Selection and Training of Teachers

The teachers of the exceptional must not only have the training and background for teaching average or normal children, but must also be equipped and trained to meet the unique problems of teaching in their specialized fields as well. They have a double burden in this respect and in addition must understand the nature of handicaps together with meeting the needs of every pupil upon an individual basis. Many school systems and states now require special certification and advanced degrees to teach exceptional children. Standards are likely to become more rigid as the problems are better understood. It takes a world of patience and optimism to teach exceptional children.

Organization

In any school system where exceptional children have full or part-time provision of special classes or schools, problems of how to organize and relate such procedures to the general system are frequently baffling. There are many obstacles to putting such a program into effect. As far as possible the exceptional should be allowed to have some opportunities to mingle with the general group of children. The ability to coordinate these programs and fuse them in such a manner that they seem to be one distinct entity is one of the big tasks of organization. The question of the effect and the implications of partial or complete segregation have never been thoroughly discussed nor completely settled.

Other Administrative Problems

The education of the exceptional is more expensive than for the average or normal child. It reaches three or four times as much for some types, such as for the totally deaf, and varying amounts for many of the others. In order to finance these additional outlays special legislation and authorizations are necessary. This entire problem is in a somewhat chaotic condition in many sections of the country. If the local expenses must be heavier than for the normal it is a problem to convince school boards, appropriating bodies, and the general public of the need for such services. While appropriations for general school purposes have become traditional, the budget for the exceptional is comparatively new and requires pioneering leadership.

The construction of special rooms or special buildings for exceptional children is a new field. Schools for crippled children with their unusual health appliances and programs, and buildings for the deaf demand special specifications. The equipment and supplies suitable to various types of the handicapped and exceptional, such as the Clear-Type Books for sight-saving classes, are examples of countless problems in an effective program for the exceptional. All of these fields, including that of aims and objectives, constitute a challenge to administration which must be met if the education of exceptional children is to proceed smoothly and effectively.

If this program is complete the school administrator has the satisfaction of knowing that 100 per cent of his school pupils are receiving maximum educational opportunity. If so, all pupils and their parents, relatives, and friends are potentially satisfied rather than dissatisfied with his educational program and system. When such facilities are lacking, the number of potential failures and malcontents both at school and in the home are increased manyfold. These facts alone, aside from the satisfaction from greater efficiency, should be sufficiently obvious to motivate a thoroughgoing program for exceptional children in all communities. In other words, it is the very best means of improving public relations for education.

The General Plan of Presentation

In earlier sections of this chapter the general order of types of the exceptional were listed with reasons for the sequence which has been selected. Within each type of handicap, as far as possible, the introduction starts from the mild handicap in the child who is considered practically average or normal and proceeds toward those with more extreme deviations. For example, Chap. III discusses the mechanics of vision and mild visual handicaps; Chap. IV presents the more extreme type of visual handicap usually considered as candidates for sight-saving classes; and Chap. V discusses the totally blind.

There is only a broad attempt to present a fixed order or list of topics to be discussed in each type of the handicapped or exceptional. Every type has its own main points of emphasis, as is well known by those who teach or deal with them. Usually there will be a definition of the problem. This delimitation will be followed by methods of diagnosis, as conducted informally by the teacher herself, by psychological clinics, or by medical specialists. Some attention will be directed to the characteristics of each type which distinguishes it from other types as well as from the average or normal. The number of cases is mentioned as one of the indexes of the importance of any particular type, together with the history of discovery and treatment. The causes, remedies, and prevention go hand in hand and often these topics are presented as a unit.

Under the general title of current problems many phases of teaching are sketched in broad outlines. If any teacher plans to equip herself to teach in any particular field, she will find in this book some general guides for further study and specialization. For most chapters there are problems for discussions and suggested projects for further study with some bibliography and a list of references. By the effective use of these broad outlines and references it is possible for students individually, or in groups, or by workshop methods, to expand their interests in any field as far as they desire.

Finally it should be emphasized that all discussions of the handicapped and the exceptional imply a warm and intimate understanding of children. Although diagnostic devices seem somewhat impersonal it is never implied that they are administered or interpreted in a cold or matter-of-fact manner. It is the purpose of all treatment that the best shall be developed in each exceptional child.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Discuss in more detail the aims and objectives such as are reported in "The Purposes of Education in American Democracy."

2. Discuss any special aims and objectives which you believe should be developed to apply especially to exceptional children.
3. Make a more detailed list of topics than is listed in the present chapter which might be included in dealing with exceptional children.
4. Give your own first impression of any exceptional children whom you have known earlier as classmates and also of any types of special classes which you have observed.
5. List some reasons why an adequate program of special education for exceptional children has been so slow to develop.

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Part II

The Physically Handicapped

INSTITUTE OF EDUCATION FOR WOMEN
Dept. of Extension
SERVICE.
CALCUTTA-27

Chapter III

DEFECTIVE VISION

Seeing, or the sense of vision, is one of the most useful and vital functions of the human body. If we are fortunate enough to have normal vision, we are likely to take it for granted. The eyes not only serve to provide the sense of vision, but they also grace the countenance with individual charm. In poetry the eyes have been called, "the mirror of the soul." The lusterless eyes of the blind lack this important phase of personality and hence the charm of the blind individual must be sought from other signs of bodily beauty and of lovely traits of personality.

In order to insure protection against injury, fully two-thirds of the eyeball is encased in the bony structure of the skull with the remaining one-third recessed well back so that the cheekbones, the nose, and the overhanging forehead insure safety except in most unusual circumstances and situations. The external portions of the eyes have further coverage by the eyelids whose instantaneous reactions save many minor and major mishaps. Finally the cornea or external transparent sheath of the eyeball is a relatively tough membrane which is able to offer further resistance to external forces. Unfortunately, after all of these safeguards have been so wonderfully provided by nature visual impairment may arise from accidents, defects, and diseases as will be described in later pages.

The Significance of Vision

Authorities universally agree that the heart ranks first as the most constantly active organ of the human body. During the long waking hours of the day the eyes could easily be nominated to occupy a close second place among the more

① heart
② eyes

ears
taste
smell
touch

active organs. It has been estimated that fully eighty-five per cent of all impressions come through the eyes. Among the other sensory organs, the ears might rank third in activity, the sense of taste would be fourth, and the sense of smell would be next. The tactile or sense of touch also ranks high, but its activities are so diverse that its position would be difficult to determine as to its frequency of activity.

In the waking hours the human eye is constantly active. Adults with normal or near normal vision make millions of major and minor adaptations of vision daily in going about their everyday affairs. These eye movements must be closely related to their logical and reasoning behavior. A good example is the visual adjustment necessary in driving a car on a busy thoroughfare at the rush hour. In addition to traffic signals, judgments must be made as to distance and clearances front and back, right and left, with instantaneous adaptations of steering wheel, brake, and accelerator. Likewise, in learning to read the young child is confronted with the complexities of correctly interpreting what he sees, translating it into meaningful response, and doing it easily and with rhythmic smoothness so that it eventually becomes nearly automatic.

Gesell[1] and his collaborators comment on the development of vision as follows:

> The development of vision in the individual child is complex, because it took countless ages of evolution in the race to bring vision to its present advanced stage. Human visual perception ranks with speech in complexity and passes through comparable developmental phases. Moreover, seeing is not a separate, isolable function; it is profoundly integrated with the total action system of the child—his posture, his manual skills and coordination, his intelligence, and even his personality make-up. Indeed vision is so intimately identified with the whole child that we cannot understand its economy and its hygiene without investigating the whole child.

The Number of Vision Defects

From careful surveys and estimates by the White House

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[1] A. Gesell, *et al.*, *Vision, Its Development in Infant and Child*, Copyright, 1949. Paul Hoeber, New York. P. 10.

Conference of Child Health and Protection[1] it was stated that 20 per cent of all children have eye defects. This number is one child out of every five and obviously many times more than first impressions would indicate. It is truly a staggering number. Among this 20 per cent, 19.75 per cent of all children are considered as having correctable defects, but obviously only a small number of these are usually corrected. The remaining 0.25 per cent of the grand total with eye defects are divided so that four-fifths of them are considered in the group of the partially seeing and the remaining one-fifth are blind. Even these fractions of 1 per cent will be found to represent thousands of children with extreme visual defects as will be noted in the next two chapters. In terms of numbers alone there is sufficient cause for serious study of the problem of defective vision. These facts are summarized in Table I.

TABLE I

PER CENT OF CHILDREN WITH VISUAL DEFECTS

Degree of Defect	*Per Cent*
Normal vision	80.00
Correctable defects	19.75
Partially seeing	0.20
Blind	0.05
Total	100.00

The Structure of the Eye

In order to understand defects of vision and diseases of the eye a brief description of the eye is necessary. The human eye is one of nature's most delicate instruments. It is a highly complex organism which has been forced to take untold punishment in recent generations. Throughout most of the period of the human race the eyes were used for outdoor, distant seeing to which they became most naturally adapted. In the past century great changes have occurred in the use of the eyes, with close indoor work, reading at close range, with rapid-moving machines in factories, and of streaming landscapes along highways and railroads. The human eye does not change quickly in two or three generations to meet these rapid changes, and hence a great number of eye defects is the logical result. The eyeball has three coats or layers, each of which has distinct functions. The outer coat, or sclera, is a tough membrane designed to contain the interior portions and act as a general protection. At the front of the eye the sclera merges into the cornea which permits the passage of light into the interior of the eye. The middle coat, or choroid, is rich in blood vessels and pigmentation. It brings life and nourishment to the eye which uses a great amount of energy. The inner coat is the retina. It contains the optic nerve which is the vital link between the eye and the brain, where there is interpretation and reasoning of what is seen. The outlet for the optic nerve to the brain leads away from the rear portion in the eyeball at a point known as the blind spot. At exactly the middle of the retina, on the rear of the interior of the eyeball, is a small area of sharpest vision called the fovea.

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[1] White House Conference, *Special Education: The Handicapped and the Gifted*, pp. 126–127.

In the front portion of the eyeball the cornea for the passage of light has already been mentioned. Just behind it is a small area known as the anterior chamber which is immediately in front of the crystalline lens. The lens is held in place by suspensory ligaments and is attached to the ciliary muscle which expands and contracts the lens. Just in front of the lens is the iris, which expands or contracts to regulate the amount of light that is permitted to enter the eye. The hole or aperture in the iris is known as the pupil of the eye. All of these portions of the front part of the eye coordinate together to accommodate the eye to the amount of light and the distance of the objects. Behind the lens and occupying about four-fifths of the eye is a transparent, gelatinous substance known as the vitreous humor, which supports the various portions of the eye in their proper places. In Chap. V on the Blind some of the diseases and disturbances of the vitreous will be discussed.

The Mechanics of Vision

In the usual process of seeing, the rays of light enter the cornea, pass through the opening of the pupil, then through the crystalline lens, and finally come to a focus on the retina at the back of the eyeball. In the normal adult eye for distances of 20 feet or more it is not necessary for the ciliary muscle to make any change in the shape of the lens, but for distances less than that, change or accommodation is necessary. When an object is close to the eye the convex curvature of the lens must be increased so that the image of the object is focused on the retina. In young children, particularly of elementary-school age, the eyeball is relatively short and the lens does not bring the focus on the retina but at a point behind it, so that many young children seem to be farsighted. The close work of the schoolroom tires their eyes unless there are periods of rest and opportunity to look at objects some distance away.

Farsightedness or hyperopia. The problem of farsightedness in young children has just been mentioned. It may exist in more severe forms, so that glasses with a proper degree of convex lens are needed to supplement the crystalline lens in bringing the focus nearer, in order to fall upon the retina. If this correction is not made, the objects seem blurred, which results in loss of interest, eye strain, and nervousness. Such defects have very harmful effects upon school work.

Nearsightedness or myopia. The opposite condition to hyperopia is myopia, or nearsightedness. The rays of light come to a focus before they reach the retina. Concave lens correction is needed to delay the focus until it reaches the retina. In many cases the child who is nearsighted continues to strain his eyes without having his defect discovered.

Astigmatism. Not all vision troubles arise from the imperfections of the crystalline lens. The cornea or front window of the eye has a curvature which supplements the curvature function of the lens. Frequently this corneal curvature has imperfections in some areas which throw the image out of focus or cause it to become distorted in some direction. Glasses are made with irregularities carefully constructed so as to compensate for the area and degree of defect. Astigmatism may pass unnoticed if the child is studied purely from the standpoint of nearsightedness or farsightedness as may be indicated roughly on such a simple device as the Snellen E chart. In astigmatism the child seems to see parts of objects clearly, and hence it may be incorrectly concluded that no defect exists at all.

Cross-eyes or strabismus. This condition causes the two eyes to look in different directions. Four out of every five of such persons have convergent squint, i.e., the eyes look inward toward each other. There may be no defect of the lens or other portions of the eye; rather, the defect comes from having the two eyes set at different angles so that they do not point approximately parallel toward the same object. Divergence occurs not only as convergent squint, or its opposite, but one eye may point higher or lower than the other. Since the two eyes should focus together as a unit, any type of divergence causes two different images to occur and vision becomes very much confused. This condition results in lack of fusion of the two images, and is very disturbing to good vision.

Fusion. Fusion of the images from the two eyes serves to give perception of depth or three dimensions in seeing. If vision arises from one eye only, two-dimension or flat perception takes place. The coordination of images from the two eyes together probably takes place as a matter of interpretation in the brain which is very important for successful vision. Whenever one eye does not focus with the other, such as in cross-eyes, or when the image is blurred in one eye, as in astigmatism, or when one eye has more distant vision than the other, there is a natural tendency to concentrate upon the clearer or better image from one eye. As a result, there is continual eye strain, and a double burden of seeing is placed upon the better eye. In due course of time the better eye breaks down under this double load and all vision is lost or practically lost. What may seem to be fairly normal vision in a child ten years of age, because he sees reasonably well without glasses, may result in blindness at twenty years of age.

There are many other types of eye defects which will not be listed here. Although the number of children with eye defects is alarmingly large and the possible results are very ominous if uncorrected, methods of diagnosis and treatment are quite definite and effective when actually used. The chief discouragement comes from an inadequate program of eye examination and failure to recognize the gravity of neglect rather than from ignorance of what should be done.

Diseases of the Eye

Up to this point the discussion has centered about defects of the eye, such as myopia. In addition to defects there are diseases of the eye which impair the effectiveness of vision and in extreme cases result in blindness. These include trachoma, glaucoma, babies' sore eyes, and many others which affect the functioning of the eye and, in some instances, destroy portions of the eye or block the passage of the rays of light to the retina. Medical eye specialists, known as ophthalmologists, are thoroughly familiar with these many diseases and with ways to combat them. There will be a more detailed discussion of these diseases in Chap. V on the Blind.

Symptoms of Vision Defect

The teacher in the regular classroom should be on the alert for cases of possible eye defect as well as eye disease. The final diagnosis should be made by competent ophthalmologists, but it is very necessary that teachers detect signs and symptoms of vision difficulty.

There is a very useful bulletin entitled, *Conserving the Sight of School Children*, by the National Society for the Prevention of Blindness.[1] That society has kindly furnished the author with "Signs of Eye Trouble in Children" as follows:

SIGNS OF EYE TROUBLE IN CHILDREN

Behavior

1. Attempts to brush away blur; rubs eyes frequently; frowns
2. Stumbles frequently or trips over small objects
3. Blinks more than usual, cries often, or is irritable when doing close work
4. Holds book or small playthings close to eyes
5. Shuts or covers one eye, tilts or thrusts head forward when looking at objects

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[1] *Conserving the Sight of School Children*, National Society for the Prevention of Blindness, New York, 1935, **6**, 54 pp.

6. Has difficulty in reading or in other school work requiring close use of the eyes
7. Is uninterested in distant objects or unable to participate in games such as playing ball
8. Holds body tense or screws up face either for distant or for close work
9. Is sensitive to light
10. Is unable to distinguish colors

Appearance

Red-rimmed, encrusted, or swollen eyelids
Repeated sties
Watery or red eyes
Crossed eyes

Complaints

Dizziness, headaches, nausea, following close eye work
Blurred or double vision

It is not intended nor expected that this list should diagnose eye defects, but the existence of several symptoms together in one child should raise serious doubt as to perfect vision. It should also be mentioned that some of these symptoms may indicate other types of difficulties such as defective hearing or general emotional maladjustment, but these facts do not detract from the usefulness and importance of the list as earmarks of possible vision defect or disease.

Inspection by Test Methods

Any method of testing the eyes upon the part of the teacher or any other lay person such as the use of the Snellen E chart should be considered as a means of eye *inspection* rather than *examination*. The term "examination" should be reserved for the more careful and scientific program of the ophthalmologist.

Snellen

Since the Snellen E chart is commonly used by teachers some brief comment about results of its use are in order. It serves a useful purpose in detecting gross disturbances, particularly in nearsightedness or myopia, and to a lesser degree in hyperopia. When a child is unable to read the E's at the proper distance it is evident that there is probably some vision defect. Many cases are discovered by its use. On the other hand cases of hyperopia easily accommodate their visual adjustment to appear as having normal vision. The myopic child is sometimes able to strain his eyes for a few seconds to see the vision chart at the normal distance of 20 feet, but such a result does not prove that vision is normal or without strain in the practical seeing of daily tasks. In cases of doubt, further observations should be made from the list of symptoms which has just been presented, or to the revised and somewhat expanded list cited by Hathaway.[1] //

Another method of visual inspection which has been developed in the past few years is the Betts Telebinocular.[2] It covers problems of effective seeing, the ability to fuse the images from the two eyes, and the dominance of the vision of one eye over the other. Although it covers more phases of vision than the Snellen E chart, nevertheless Betts emphasizes that final diagnosis should be made by the ophthalmologist with his background of medical training and experience.

Betts Telebinocular

The Massachusetts Vision Test developed by the Massachusetts Department of Public Health is designed to test keenness of vision, and to give evidence of tensions with[3] resulting fatigue, nervousness, poor concentration, and lack of fusion or binocular coordination. The authors of the test claim that it may be easily administered by persons who are experienced in handling children.

Mass. Vision Test

Shaffer[4] reported on the comparative effectiveness of the Snellen, the Telebinocular, and the Massachusetts tests as effective screening devices preliminary to thorough ophthalmological examinations of 203 pupils from grades I to XI in the University School at Ohio State University in the spring of 1947. He reported that the Snellen Chart was the most reliable single screening procedure; that the Telebinocular had a much higher over-referral rate and is not significantly more accurate in finding cases in need of referral. He concluded that the Massachusetts Test did not merit inclusion as a basis of selecting cases for referral, and that its margin of over-referral was too high.

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[1] W. Hathaway, *Education and Health of the Partially Seeing Child*, National Society for the Prevention of Blindness, New York, 1947, pp. 178–179.

[2] Available through the Keystone View Co., Meadville, Pa.

[3] *Instructions for the Massachusetts Vision Test*, The Massachusetts Department of Public Health, Division of Child Hygiene, Boston, 1941.

[4] T. E. Shaffer, "Study of Vision Testing Procedures," *American Journal of Public Health*, 1948, **38**, pp. 1141–1146.

The School's Role

There are several variables to be taken into account in setting up the policy for visual inspection, diagnosis, and the correction of remediable defects. They include the time and expense involved in using simple versus complex methods of visual inspection, the availability of low-cost, yet reliable diagnostic facilities, and the willingness and financial ability of families to underwrite the expense of visual corrections. In some communities where there has been little or no attention given to visual or other physical disabilities, it may be necessary to proceed slowly because of possible conservatism. It should be the exception rather than the rule that parents are indifferent or unwilling to have vision correction for their children.

Although at first thought it would logically be expected that school systems make adequate educational provision for the partially-seeing and for the totally blind, unfortunately such is not the case. Only in a few of the larger cities do the educational provisions approach the maximum and country-wide schools fall far short of this goal. Since many visually-defective children continue to be enrolled in regular grades, it is important that all teachers should become acquainted with the general characteristics of the visually handicapped children. Special supervisory and other aids should be available to these regular teachers.

In a very useful bulletin entitled, *Helping the Exceptional Child in the Regular Classroom*, issued by Eugene B. Elliott, Superintendent of Public Instruction, Lansing, Michigan,[1] the following suggestions are offered:

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[1] F. E. Lord, *Helping the Exceptional Child in the Regular Classroom*, Bulletin No. 315, Superintendent of Public Instruction, Lansing, Mich., 1941, pp. 15–16. Quoted by permission.

Classroom adjustments: Get a doctor's recommendation and follow it. If the child is fitted with glasses and remains in the regular classroom, the following points should be closely observed:

General:

1. Glasses should be worn constantly, if recommended.
2. They should be kept clean and should be properly worn; this means that the child should look through the center of the lens at all times.
3. Light should be good and should come from over the left shoulder except in cases of left-handedness.
4. Children should sit so that all blackboard work, charts, demonstrations, etc., are visible.

Methods:

1. Permit child to sit or move where he has good light and can see class work. He should not sit facing the light nor should he have his back to the light and there should be no glaring surfaces within his line of vision.
2. He should sit erect and bring his work up to the necessary level for seeing.
3. Avoid excessive or unnecessary reading. (Employ the services of a reader whenever possible, especially in the upper grades where assignments are long.)
4. Plan work so the child's schedule is based on eye work followed by eye rest periods. (A change of focus is considered as an eye rest period—from desk work to blackboard work or to the typewriter and vice versa.)
5. Rest the eyes frequently by closing them or by looking away from the book or work.
6. Child may participate with regular grade pupils in all subjects with the exception of sewing, mechanical drawing, and library. In art, he should work in the large; should not draw with a pencil.
7. All writing on blackboards should be large. Use soft chalk on clean blackboards.
8. Manuscript writing is advisable.
9. Children recuperating from illnesses should refrain from using their eyes for long periods at a time.

Equipment:

1. Whenever possible, use a movable, adjustable, tilt-top desk. If the desk top is flat, use a copy holder for resting working material on eye level.
2. Use a bulletin typewriter with upper and lower case letters.

Materials:

1. Procure books of 18 or 24-point type from the nearest center having a sight-saving class, or from local or county libraries.
2. Use unglazed paper of an eggshell color and soft lead pencil.

Although these suggestions are listed chiefly with regard to children of the sight-saving type many are also useful in modified form for children with mild vision defects in regular grades.

General Suggestions

From the information and materials offered in this chapter a few general suggestions about teaching are offered:

1. The modern teacher in regular grades, as well as in special classes for the exceptional, must be aware of children as well as of subject matter and methods of teaching.
2. This awareness should include recognition of eye defects as well as many other types of handicaps and deviations.
3. There is often a combination of defects operating in the same child. For example, the visually handicapped child may also be nervous on account of the unusual strain resulting from poor vision.
4. The teacher must be informed about procedures of teaching various types of exceptional children because they may continue to be enrolled in her classes in the absence of special provision or be sent into her classroom from the special classes for recitation and work with regular pupils.
5. She should be informed about all types of exceptional children so that she may recognize them in their main characteristics and be helpful in getting them properly placed in the appropriate special class. She is the most effective salesperson to parents and the children themselves about the advantages and opportunities which such special classes have to offer.
6. Since parents are interested in the welfare and success of their children as individuals, it is necessary for the

> teacher of today to take an active and aggressive interest in each child as well as in the success of her entire group.

On account of these and many other reasons of equal merit, teachers and administrators should anticipate the opportunity of learning about all exceptional types such as will be considered in the following chapters.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Give any examples which you may know where glasses have not been procured and give probable reasons.
2. If you are particularly interested in the structure and function of the eye, prepare a more detailed diagram than is shown in the text.
3. List additional types of eye defects besides those cited in the text, with descriptions about them.
4. Give any experiences which you may have had with the use of the Snellen E chart, with advantages and limitations of results.
5. Describe any other types of eye-inspection techniques which you may have used.
6. Describe any changes in your opinions and ideas about vision handicaps from the discussions of this chapter.

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Chapter IV

THE PARTIALLY SEEING

In the preceding chapter there was a general introduction to problems of defective vision. Children with mild eye defects were discussed, together with duties and information for the teacher of regular classrooms. It was pointed out that while the mild defects were relatively less serious for any individual child, the large number of such cases makes the total volume of vision loss very important. In the present chapter the partially seeing will constitute an important group of exceptional children.

The number of children with visual defects of varying degree illustrates the so-called frequency distribution in a typical manner. Near the average for vision, there is a large number of cases and as the extremes are approached the number of cases decreases rapidly. It should be recalled that about 19.75 per cent of all children have some visual defects which are largely correctable, with 0.2 per cent classified as partially seeing, and 0.05 per cent as totally blind.

.2%

There are no extremely sharp breaks between the visually defective, classified as correctable in regular grades, and the partially seeing, nor between the partially seeing and the blind. The most extreme case of the correctable is practically as much handicapped as the mildest type of the partially seeing, and an equally imaginary line also exists between the partially seeing and the blind. However, there are general limits such as divide individuals who are short in stature from those of average height.

[illegible] not gen'l limits

The Field of the Partially Seeing

In the preceding chapter there was a list of symptoms of defective vision which should be available for continuous consultation by teachers, parents, and all who deal with childrens' vision. The Snellen E chart is a helpful means of *visual inspection;* for potential candidates for sight-saving classes any unfavorable results obtained by its use should be considered very significant. The final diagnosis should be made by a competent medical specialist, known as an ophthalmologist or oculist. Through his use of more refined instruments than noted above, a thorough *eye examination* is made, with recommendation for the sight-saving class, classes for the blind known as the Braille classes, or for enrollment in the regular grades.

① There are four types of cases who are potential candidates for sight-saving classes. The first type is defined chiefly in terms of amount of defective vision. The standard for the sight-saving class is vision poorer than 20/70 in the better eye after correction has been made, with competent diagnosis. The term "20/70" is interpreted to mean that an object can be seen at a distance of 20 feet, which should ordinarily be seen at 70 feet. This distance is the upper or better limit which distinguishes it from candidates for regular grades. In terms of distance of vision, the lower limit or dividing line between sight-saving and Braille classes is 20/200 in the better eye after correction. These are rough limits only, hence the opinion of the experienced eye specialist is the most important guide in individual cases. The basic difference between the sight-saving and the Braille lies primarily in the use of *some* vision in the sight-saving class, whereas in the Braille classes, senses *other than* vision are the chief bases of learning.

② The second type of sight-saving candidate is afflicted with progressive myopia. Myopia or nearsightedness frequently becomes more and more aggravated if it is not discovered and corrected. The child finds increasing difficulty in seeing his school work. He leans over his desk closer and closer to his books and materials, adding to the strain, as well as to the blood-shot condition of his eyes. When these conditions are discovered the diagnosis is progressive myopia. Such children should be placed in a sight-saving class even before their vision becomes as poor as the general limit of 20/70 noted in the preceding paragraph. Progressive myopia may frequently be checked if detected early enough, and if proper safeguards are used, such as enrollment in the sight-saving class. Unfortunately, there are many cases in which discovery and correction are too late or lacking altogether. Total blindness results when the retina is torn loose by the strain of trying to reach the focus of the image that is farther ahead than usual within the eyeball.

③ The third type of sight-saving candidate is the child with noncommunicable diseases of the eye, requiring great care to conserve the remaining vision. In this group are also included cases in which bodily diseases have affected the vision and for whom conservation of seeing is highly important.

④ The fourth type consists of those who may be enrolled temporarily in sight-saving classes. They include cases recovering from eye operations, weaknesses from such diseases as measles which frequently leave the eyes in a poor condition, and cases in which the eye muscles require reeducation.

It will be noted from the various types of cases that there are many qualifications for admission to sight-saving classes. Enrollment in the sight-saving class is flexible and is designed to serve temporary as well as long-time needs.

The Number of Cases

It was mentioned in the preceding chapter that 0.2 per cent of all children had visual defects sufficiently grave to be classified as partially seeing. This is a ratio of one to every five hundred pupils. It runs true to form for the actual enrollments in sight-saving classes in the larger cities. However, there are some estimates which place the number at one in one thousand or about one-half as many as this figure, although the enrollments noted above are a better proof of the higher figure.

According to the ratio of one to five hundred there are approximately fifty thousand children in the United States who are potential candidates for partially seeing or sight-saving classes. The actual enrollments in such classes falls far below this number. In 1930 the White House Conference[1] estimated that only five thousand such children were actually enrolled in sight-saving classes, or 10 per cent of the total number. By 1938,[2] the number had increased to about 7500, which is an encouraging trend, although it still provides for only one out of every seven in need of such special facilities.

It is interesting to apply these figures to the general school population in order to learn of the present limitations of the program. The ratio is one sight-saving child to every five hundred children. If a sight-saving class has an enrollment of only eight members, which is the minimum standard in some states, it would mean that any community with a school population of four thousand pupils would have a possible eight members for the sight-saving class. General enrollment figures indicate that any community tends to average about one-fifth of its total population in school. In a city of twenty thousand general population with a school population of four thousand, there should be one sight-saving class of eight members. There are hundreds of cities with populations of twenty thousand or more which do not make any provision for sight-saving classes, or as a matter of fact, for any other types of exceptional children. On the other hand, there are a few cities of less than twenty thousand population which combine their educational facilities with the smaller towns and rural areas and conduct at least one sight-saving class. Unfortunately, it is not a matter of numbers, but rather of inadequate knowledge about such needs as sight-saving classes, which keeps the present figure down to one out of every seven with such special provisions.

Characteristics

It has been emphasized in earlier chapters that exceptional children are similar to average or normal children in many ways. They deviate from them in some respect, such as defective vision, which requires different educational methods appropriate to their classroom needs. They have interests similar to those of normal children, they need affection and recognition, they would taste the pleasure of success, be accepted by their friends, and through a long list of other characteristics they are fully as human as those who are fortunate enough to have normal vision.

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[1] White House Conference, *Special Education: The Handicapped and the Gifted*, p. 5.

[2] M. E. Frampton and H. G. Rowell, *Education of the Handicapped, Vol. I, History*, p. 44.

The partially seeing depend upon vision, but upon a vision which is very much restricted and does not give full use of the eyes. Sometimes it is near the margin of blindness, particularly in cases of progressive myopia. However, the emphasis in sight-saving classes is upon the positive factor of saving the sight, which is typified in the name of the class itself. The partially seeing are different from the normally seeing in that they are usually aware of their visual limitations. This condition is somewhat parallel to the precautions which sick people must constantly make in the use of their strength, their digestion, and other bodily functions which ordinarily work in a normal, automatic manner when health is good.

Actual studies of any special characteristics of the partially seeing are very few. All writers who mention this subject express opinions that there are probably some important psychological problems. Frampton and Rowell[1] note that they seem to follow a deprivation pattern, as a result of being cut off from many contacts with normally visioned children. They believe introversion is quite common, with daydreaming as its most frequent form. These same writers also note that very heavy glasses give a somewhat unpleasant appearance and make it difficult to cultivate good social contacts. Poor vision causes nonparticipation in many games and a necessary withdrawal from the social group. The various behavior observations by the National Society for the Prevention of Blindness, listed in Chap. III, disclose many kinds of behavior which are not typical of the normally seeing.

Merry[2] notes the possibility that undue nervous tension from attempting to see with the reduced vision has emotional effects upon the partially seeing. He states that many have feelings of inferiority and mental inadequacy from not being able to keep up while enrolled in the regular grades. Informal observations by the writer indicate that when many candidates for sight-saving classes first enroll in them, they have a high degree of tension that is gradually reduced as the strain of competing with the normally seeing is lessened. Hearon [1] believes that many emotional factors arise from defective vision and are probably a causative factor in personality maladjustment. It would seem that careful studies of these factors would be not only beneficial to the children themselves, but also a good point of departure in extending the present limited number of sight-saving classes.

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[1] M. E. Frampton and H. G. Rowell, *Education of the Handicapped, Vol. II, Problems,* pp. 189–190.

[2] R. V. Merry, *Problems in the Education of Visually Handicapped Children,* Harvard University Press, Cambridge, Mass., 1933, p. 165.

Surveys of intelligence. There have been very few reports of surveys of the intelligence of sight-saving-class pupils. Myers reported on a summary for several cities for the White House Conference on Child Health and Protection [2] with results as shown below for 970 cases:

TABLE II

INTELLIGENCE OF SIGHT-SAVING-CLASS PUPILS

I.Q. Interval	*Myers' Report*		*Recent Detroit Report*	
	Cases	*Per Cent*	*Cases*	*Per Cent*
Below 70	94	9.7	12	6.3
71–79	169	17.4	28	14.7
80–89	245	25.3	44	23.1
90–109	373	38.4	91	48.0
110–119	63	6.5	13	6.8
120–139	26	2.7	2	1.1
Totals	970	100.0	190	100.0

In the Myers' report it is not stated what kinds of psychological examinations were given and under what conditions. The median I.Q. was slightly below 90. In the same table is shown a distribution of I.Q.'s for pupils in Detroit's Sight-Saving Classes, during the years 1939 to 1942. The median is about 93. All of these Detroit cases were tested individually by the same examiner who used the 1915 Stanford-Binet Test with certain tests reproduced in larger form,[1] and having heavier and darker lines. In this Detroit group there were 27 pupils in Grades 1 to 3, median I.Q., 84; 70 in Grades 4 to 6, median, 92; 56 in Grades 7 to 9, median I.Q., 92; 37 in Grades 10 to 12, median I.Q., 100. They represent mostly new enrollees in the various classes throughout the city during this period.

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[1] E. L. Hearon, "Emotional Life in the Education of the Visually Handicapped," *Sight-Saving Class Exchange*, 1939, No. 67, pp. 6–11.

[2] White House Conference on Child Health and Protection, *Special Education: The Handicapped and the Gifted*, p. 205.

The medians of the Myers and Detroit groups are at the lower end of the normal range. Theoretically there should be no reason why the partially seeing should be slightly below the normally seeing in intelligence. Any apparent minor difference might well be accounted for in the difficulty of seeing the test material, even in its enlarged form, as in the Detroit testing. In London, where the classes for the partially seeing are limited to cases of progressive myopia, the median I.Q. is 94, very similar to the Detroit results.

Types of Eye Defects

In the preceding chapter some mention was made of certain common types of eye defects. They will be listed briefly at this point but with special emphasis upon extreme conditions which qualify certain children for sight-saving classes.

Hyperopia or farsightedness. In hyperopia or farsightedness the lens does not bring the rays to a focus soon enough, so that there is a blurred image on the retina and the point of focus is a theoretical one back of the retina. The lens is too flat or it is not sufficiently flexible to produce the focus at the correct point. The person sees distant objects more distinctly than those close at hand. Hyperopia is a somewhat natural condition in little children about the age of school entrance or younger, and is partly due to the small or shortened eyeball which has not yet reached full growth. In other children the defect lies within the lens itself, and the correction is a properly fitted pair of glasses with convex lenses which make an additional convergence of the light rays.

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[1] Available through the C. H. Stoelting Company, Chicago.

The diagnosis of hyperopia cannot be made for certainty with the Snellen E chart since pupils of normal vision may often be able to accommodate their eyes for short periods so as to see the same sized letters. There are many other symptoms such as blurred vision, inattention to schoolwork, constant looking out of the window, and others listed in the preceding chapter. Only a small proportion of the enrollment in sight-saving classes suffers from hyperopia since the defect may be corrected largely by proper refraction.

Myopia or nearsightedness. Myopia or nearsightedness is the opposite condition to hyperopia. In myopia the crystalline lens is too convex and the rays of light come to a focus somewhere within the eyeball before they reach the retina.

Many of the symptoms of general behavior are the same as for hyperopia, but it is somewhat more obvious because the pupil cannot see as far as across the schoolroom, or he is discovered leaning very closely over books and other school tasks. He gets into cramped and tiring positions which are harmful to the eyes and fatiguing to the muscles of the neck and shoulders. In leaning over books, which he lays on his desk and looks on directly from above, the eyes become bloodshot and further strained. The eye conditions become worse and develop into what is commonly known as progressive myopia.

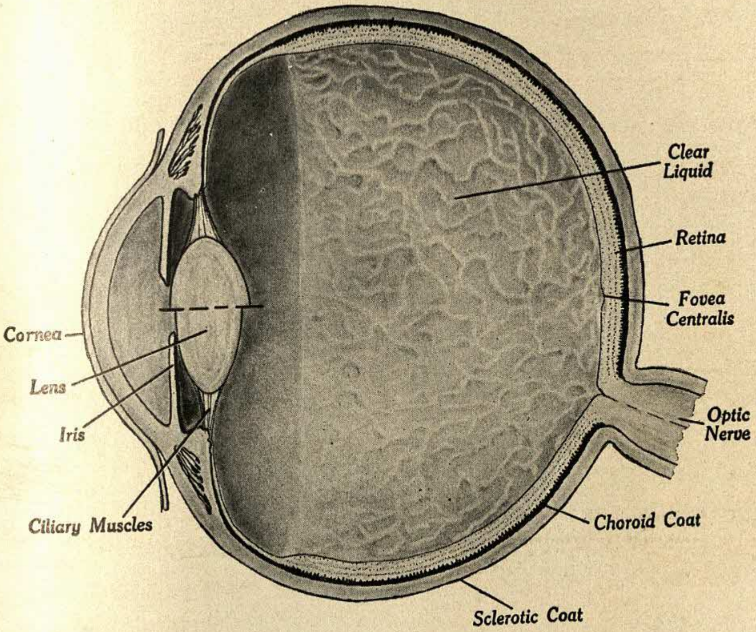
Another disastrous effect of myopia is that the optic nerve, seated in the retina, strains to move farther forward so as to catch the focus which is in front of it. Eventually the retina is torn loose from the back of the eyeball. This condition is known as detached retina. Blindness results when it happens. It has been noted that myopia cases are closely akin to complete blindness.

The general condition of fatigue and weakness of the eyes must be taken into account in making an optimum correction. The lens of the eye itself may not function properly even with the assistance of glasses. There is probably a weakened condition of the ciliary muscles and also a lack of toughness of the sclerotic coat of the eye. Even with the best correction, vision may remain worse than 20/70 in the better eye after refraction, which is a general limit for admission to sight-saving classes. However, each case is determined upon its own merits, upon the general condition of the eyes, and upon the judgment of the ophthalmologist. The great majority of sight-saving class pupils are myopes.

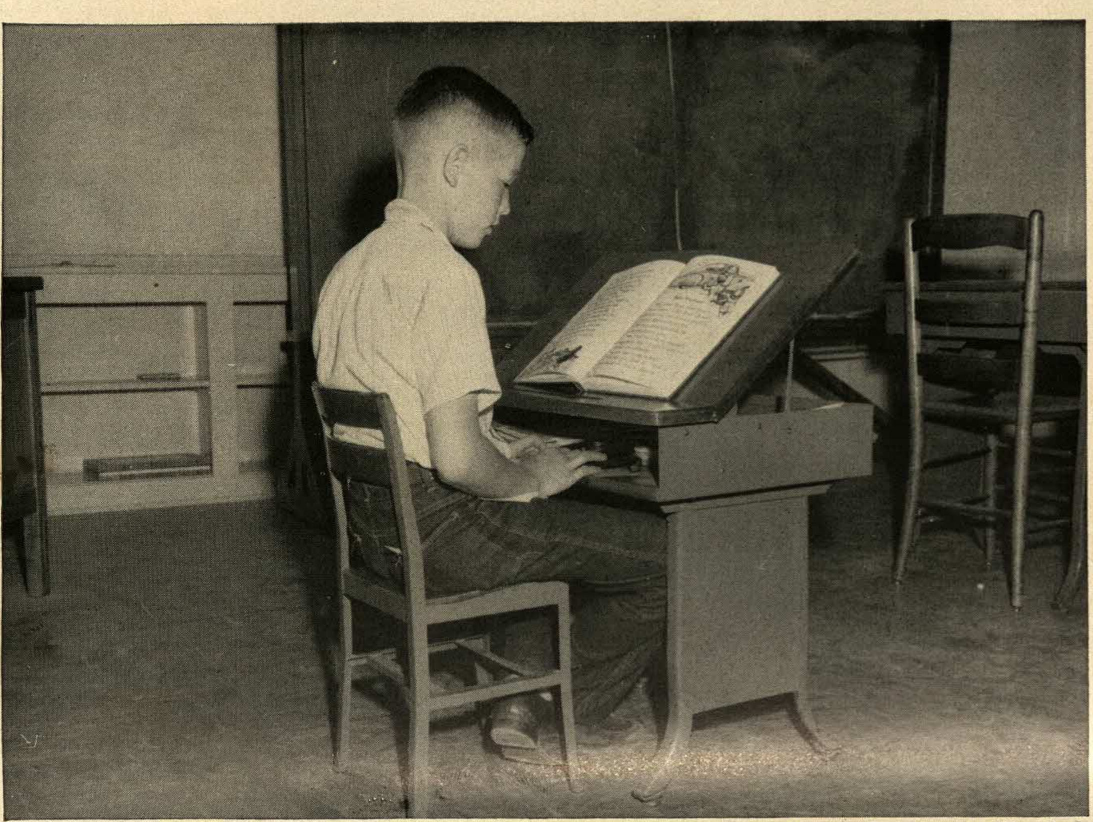
Astigmatism. A third important defect of the eyes is known as astigmatism. It may arise from either or both of two sources and produce a blurred or imperfect image. The first and most ① common form is caused by irregularity in the curved surface of the cornea or outer window of the eye. This cornea has some power of refraction and deflects the rays so that they meet the crystalline lens in a distorted manner, which must be measured very carefully and corrected by the proper kind of glasses. Images are as distorted as those obtained by looking through very imperfect glass in windows of early colonial houses in which bubbles and waves appear in the window glass itself. The author remembers from boyhood the many weird forms and shapes of the landscape from such windows. Imperfections in the crystalline lens itself cause distortions.

The usual discovery is by the familiar astigmatic dial in which closely grouped sets of lines radiate from the hub of a wheel. The astigmatic person incorrectly believes that some portion seems to be shaded more heavily than the remainder. Astigmatism is frequently complicated by hyperopia or myopia so that each case becomes a very unique, individual problem for correction.

Lack of fusion. Under lack of fusion many varieties of visual handicap are to be found. Fusion denotes the correct coordination of the vision of the two eyes together so that depth perception and other characteristics of perfect bifocal vision are in operation. The many types of faulty fusion are classified under the general term of heterophoria. One of the less common ① types occurs when one eyeball is tilted at a higher or lower angle than the other. In attempting to read, one eye sees the bottoms of letters and words while the other sees the top, and without meaningful coordination. Even slight disturbances in



The human eye.



Courtesy San Antonio public schools

Special table and book for low vision, Eloise Japhet School for Exceptional Children, San Antonio, Texas.

this direction are very distracting to good reading or other effective vision. A second less frequent type occurs when ② the eyes diverge so that they seem to be looking away in opposite directions, while in the more common form known as squint or cross-eyes the eyes appear to converge or turn in toward the nose. About 1 per cent of children under twelve years of age are afflicted with squint.

There are two causes of squint. One common cause is that ① the muscles which control the direction of the two eyes are distorted. In some instances it may be corrected by skillful surgical operation. A second cause results from general weakness ② of one eye, which automatically leaves the entire burden of seeing to the stronger eye, by turning away to avoid its own responsibility. In the latter type the better eye is sometimes covered by a bandage, under ophthalmological care, so that the weaker eye is forced to improve by exercise and continual use. The theory is that practice develops strength and perfection so that the image is no longer blurred. One should not experiment on these matters and should never act without skilled ophthalmological advice.

Aniseikonia is a defect in which the images from the two eyes may each be perfect, but one is larger than the other. It is very difficult to get blending or proper fusion of vision from the two eyes. Nystagmus is a defect in which the muscles which control the movement of the eyeballs at different angles in their sockets do not operate in the usual manner. They seem to throw the eyes out of the direction of desired vision and roll them at unusual angles. Sometimes they affect both eyes together in similar directions, but in other cases the eyes seem to rotate independently of each other. In other cases, there is a constant sidewise motion of the eyeballs.

In albinos there is a lack of pigmentation throughout the body including the eyes. As a class, albinos tend to have poor eyesight and to be very sensitive to strong light, which results from the lack of the usual protection offered by the color of the iris. The preventive program of the sight-saving class is usually very beneficial.

There are also certain diseases of the eye which indicate the need of a sight-saving class. These diseases will be discussed in the following chapter on the Blind.

History of the Partially Seeing

The history of the partially seeing will be discussed in terms of a few famous characters of history, and the development of the modern sight-saving class.

From the earliest accounts of history there have been many famous men who were partially blind, blind in one eye, or suffering from some type of eye disease, which made their seeing very difficult.[1] In the Book of Genesis is found: "And it came to pass that when Isaac was old, his eyes were dim, so that he could not see." In Grecian days, Philip of Macedon, father of Alexander the Great, lost an eye from an arrow wound about 353 B.C. Rome also had its eye casualties: Hannibal lost one eye in the Second Punic War, and Horace lost one in 507 B.C. He also sustained a second physical injury when he permanently disabled one hip from jumping into the Tiber River in a battle to defend Rome. The orator, Cicero, had a type of recurrent eye disease over a period of years. The very myopic Nero used to view gladiatorial combats through some kind of concave emerald which probably improved his vision.

Records of later periods also give evidence of the existence of eye defects. On a tombstone in a Florentine chapel is the following inscription: "Here lies Salvino D'Armati, a native of Florence, the inventor of spectacles. May God forgive him his sins. Died in the year of our Lord, 1317." Apparently D'Armati's work bore some fruit, for more than a century later Leonardo da Vinci, the famous painter and engineer, wore glasses with minus two diopter spheres. Gustavus Adolphus, king of the Swedes and military leader of the Protestants, was killed in the Battle of Lutzen in 1532 when his myopic vision betrayed him into the hands of the Germans as he strayed from his followers.

Daltonism was a name frequently given to color blindness from the famous John Dalton, who wrote the first great work on color vision. He was also the father of the atomic theory. He is said to have worn color combinations which were the marvel and amazement of his age. The poet Schiller and the musician Beethoven were both very myopic; the poet Milton had progressive myopia which resulted in blindness after long strain caused detached retina. This cause of blindness is now known and is more often treated before its effects become so disastrous. Guy de Maupassant, a great French short-story writer, had diplopia due to paralysis of the extraocular muscles, and his death resulted from the general paresis caused by it. Dr. George Gould [1] writes that many famous myopic individuals wrote or created many gloomy and pessimistic masterpieces including the works of Nietzsche, the two Carlyles, George Eliot, and Schopenhauer. Whittier, Elizabeth Barrett Browning, Darwin, Coleridge, and others avoided this myopic tendency by giving up close work and resorting to walking or other outdoor exercise to check the progressive conditions of myopia.

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[1] C. A. Bahn, "The Eyes of Some Famous Historical Characters, I. Little Journeys in Ophthalmology," *The American Journal of Ophthalmology*, 1933, **16**, pp. 425–429.

The vigorous Teddy Roosevelt had very astigmatic vision, and he lost one eye from an injury in a friendly boxing contest in the White House. President Wilson became blind in one eye from a retinal hemorrhage. The portraits of the great Lincoln show that his eyes probably had a very hyperopic condition.

History of Education of the Partially Seeing

The partially seeing were a very neglected group throughout the early days of the period when education for the masses became popular. Most of them were in the regular grades, but a few of the more seriously handicapped were in schools for the blind, which were recognized as unsuitable places for them. Methods of educating the totally blind and the partially seeing are entirely different, and wherever the partially seeing have been placed with the blind Braille methods usually prevail, to the detriment of the partially seeing. More than one hundred years ago, Franz von Gaheis of Austria recognized that the partially seeing should not be educated with the blind because the blind used them as the "eyes of the blind," thus robbing the blind of the independence which was considered desirable for them. The partially seeing tended to develop superiority complexes and became spoiled children who failed to learn their own true place in the world.

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[1] G. Gould, *Biographic Clinics*, The Blakiston Company, Philadelphia, 1900–1906, 3, 72 pp.

In England the evils of mixing the two groups became recognized strongly enough so that in 1908 separate classes were started for the partially seeing, but these were limited strictly to myopic cases. This policy has tended to persist in that country. Shortly afterward, Robert Irwin started a class for the blind in Cleveland in 1909, and some partially seeing children were also admitted. After some unsatisfactory experiences, by the fall of 1913 he organized a separate class for the partially seeing. This was the first such class in America. In the same year classes were established in Boston, Roxbury, Newark, and Jersey City. Cincinnati followed in 1914, Detroit in 1915, New York City in 1916.

The Modern Sight-Saving Class

The modern sight-saving class has rapidly increased in popularity. From a beginning of 2 classes in 1913 there were in 1938 571 classes with approximately 7500 enrolled. If there are about 50,000 children in need of such a program only about one-seventh of the number have such facilities, but very hopeful progress has been made.

These classes enroll about fifteen pupils when a large range of grades is represented, and a few more if the class range is less. Emphasis is not upon numbers since much individual work must be done. The rooms are usually part of a regular school building, and of full size with provision for movable desks and best conditions of lighting.

An excellent bulletin by the National Society for the Prevention of Blindness on *Sight-Saving Classes, Organization and Administration*[1] gives full details about lighting, equipment, large type printing of books, general organization of the class, and many other essential features.

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[1] *Sight-Saving Classes, Organization and Administration,* National Society for the Prevention of Blindness, New York, 1937, **30,** 31 pp.

The teacher of the sight-saving class needs to be especially trained in the mechanisms of vision, methods of saving sight, mastery of subject matter from the many fields and grades represented in her class, and the ability to cooperate closely with regular teachers since most recitations are carried on by sending the pupils into the regular classes. As in other types of the handicapped, there is a great satisfaction in seeing the wonderful results made possible only by the opportunities which the sight-saving class provide.

Educational Results

The most complete report of achievement in sight-saving classes is by Peck from the Cleveland schools. With an approximate I.Q. of 94 the pupils numbering over 200 in Grades 2 through 9 showed a reading achievement on the Stanford Achievement Test of fairly close to the norms for the grades in which the pupils were located, and therefore with no serious trend toward reading disability. There is some overageness among the sight-saving pupils, but in the White House Conference Report on 356 cases, the promotion rate was 73.7 per cent before placement in such classes and 91 per cent after placement. This is clear evidence of the advantage of such classes.

Vocational Placement

There is little evidence about vocational placement in reports separate from other types of exceptional children. However, reports on all types of physically handicapped issued by state bureaus for the rehabilitation of physically handicapped civilians show a vast amount of successful placement for the sight-saving cases.

Outlook for the Partially Sighted

The outlook for the partially sighted is quite hopeful. The methods of diagnosis and treatment have made rapid advances. Classes for sight-saving pupils have increased rapidly and materials of instruction have kept pace. Better methods of prevention should ultimately reduce the number of the partially seeing, but this program is probably some years hence. Advances in better lighting and in principles of sight-saving methods are being incorporated into the programs for the normally seeing as preventive measures. Hathaway [1] gives an optimistic report along the lines of medical and optical advances, including diathermic treatment for detached retina, advances in lighting with more light particularly for astigmatic eyes, auditory aids with talking books and wider use of radio for educational purposes, and advances in vocational guidance with a steadily increasing number of suitable occupations from which the partially seeing may select.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Discuss orally or in writing any firsthand experiences which you may have had with any partially seeing persons and interpret them in the light of problems discussed in this chapter.
2. Discuss why any arbitrary definition of the partially seeing in terms of limits of vision is not a practical means of classification.
3. Describe your impressions or observations of the general emotional or nervous stability for some individual with rather defective vision.
4. Make a very detailed and complete drawing of the eye and all its parts such as described in Posey's *Hygiene of the Eye.*
5. If possible, visit the office of an ophthalmologist and have him explain the equipment and give a demonstration.
6. Visit a sight-saving class and observe the many important phases of the program.
7. Make contacts with the local luncheon clubs to learn firsthand what they are doing for the partially seeing; report it to the class.
8. Prepare a list and brief description of pamphlets or bulletins on visual conditions issued by such organizations as The National Society for the Prevention of Blindness, The American Foundation for the Blind, The Office of Education, National Public Health Associations.

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[1] W. Hathaway, "New Trends in Sight-Saving Class Activities," *Sight-Saving Review,* 1938, **8**, pp. 106–115

Chapter V

THE BLIND

The extreme gravity of blindness has stirred mankind throughout the ages to most notable endeavors in their behalf. As a class the blind do not want sympathy. It is an interesting and gripping experience to assemble together even in a sketchy outline the story of the blind. It is filled with the deeds of countless pioneers whose collective efforts have brought the education of the blind slowly up to its present state of comparative perfection.

These pioneers delved into many phases of blindness, including methods of teaching, into the physiology and psychology of the blind, into the establishment of schools, and into legal and financial provisions for care and protection.

Definitions of Blindness

At first thought the definition of blindness seems very simple and final. However, this is not the case, since there are many kinds and degrees of blindness. Some blind persons live in a world of total darkness, others have some degree of vision but exist in such a state of uncorrectable confusion that what sight they have is of no practical value. Blindness also includes a very slight amount of vision in which gross forms, such as buildings or trees, are perceived in dim but ineffective ways.

There are many formal definitions of blindness, of which a few of the most significant will be cited. The Committee on the Visually Handicapped of the White House Conference on Child Health and Protection of 1930 defined blindness as "A blind person is one who cannot use his eyes for education."[1]

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[1] White House Conference on Child Health and Protection, *The Handicapped Child*, p. 1.

The United States census enumerators of 1920 and 1930 carried instructions for listing the blind as follows: "Include as blind any person who cannot see well enough to read even with the aid of glasses." [1] In a 1941 bulletin issued by the Michigan Superintendent of Public Instruction, a blind person is defined as ". . . an individual who must learn and live aided by senses other than vision. He may be totally without sight; he may have light or object perception; he may be able to read very large type in a limited amount. The visual acuity of the person who is blind is ordinarily 20/200 or less, according to tests made with a Snellen Symbol E chart." [2]

For the purpose of determining whether a child is sufficiently blind to warrant placement in a class for blind children, commonly known as Braille classes, the final diagnosis should be made by an ophthalmologist. He is a bona fide physician specializing in diseases of the eyes, and on their care and treatment.

Some further comments are timely at this point about the role of the teacher in the examination of pupils for visual and other defects. Teachers generally are encouraged to use the nontechnical devices such as the Snellen E chart for first screening of vision cases. When pupils show deviations from the usual standard by this method or by informal observation, they should be referred to the proper diagnostic agency for final diagnosis. In some cases this final diagnosis may be at variance with the tentative findings of the teacher, but the results should never discourage the teacher from continuing her testing program. She should maintain her enthusiasm no matter what the outcome may be. The initial discovery of the great majority of all types of exceptional children necessarily has its source in the regular classroom.

Before leaving the definition of blindness the meaning of 20/200 should be clarified. It is not a fraction denoting 10 per cent vision but rather that an object ordinarily seen by the normal eye at a distance of 200 feet can be seen only when it is as close as 20 feet. Furthermore, this vision at 20 feet is possible only in the better eye after the maximum correction by glasses has been achieved. For vision better than 20/200 but poorer than 20/70 after correction the pupils are usually considered eligible for a sight-saving class as described in the preceding chapter. No arbitrary lines in terms of distance of vision are actually used; each case is decided upon its particular merits according to the judgment of the ophthalmologist.

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[1] U. S. Census reports.

[2] F. E. Lord, *Helping the Exceptional Child in the Regular Classroom*, Bulletin No. 315, Superintendent of Public Instruction, Lansing, Mich., 1941, pp. 17–18.

Characteristics of the Blind

The blind person lives in a world more limited than that of the partially seeing. It is desirable at this point to describe some of their characteristics in order to understand them better. Usually the first impression upon meeting blind persons is sympathy for them. As a class the blind do not want sympathy; actually, they want understanding and an opportunity to make a place for themselves in the world. Teachers of the blind quickly learn to keep their sympathy under control so that the relationship between teacher and pupil is approximately the same as in the case of seeing children.

There are various ways in which seeing persons can imitate the conditions of blindness so that they may have a better understanding. It is related that more than one hundred years ago Dr. Samuel Gridley Howe, the first director of the Perkins Institution for the Blind, went around blindfolded for days at a time so that he might have better insight into problems of the blind. He was not beset with the dangers of fast-moving traffic which harass the blind today. Any individual who blindfolds himself even for short periods soon becomes more aware of, and pays more attention to other senses, and this is also true of the blind themselves. Riding blindfolded as a passenger in an automobile calls attention to bodily stresses and strains from going around curves or stopping unexpectedly. The difference is not that these bodily sensations, mainly kinesthetic, are more intense in the blind, but rather that they are not anticipated and that their very unexpectedness focuses greater attention upon them. In a similar manner the kinesthetic sensations generally replace the visual in dark and mysterious journeys through certain attractions in amusement parks. The rider travels along in a small car or chair in which many jolts and turns are unexpectedly introduced. There are sudden turns, a rough piece of track produces a rocking motion, followed immediately by an uncomfortable reclining position. The noise of the travel is exaggerated in the absense of vision. A few flashes of light at brief intervals makes the adjustment to darkness more difficult. These types of experiences are designed to provide novel amusement, but they also give a brief preview of what the blind always experience.

There are many popular misconceptions about the extraordinary development of other senses in the blind to compensate for the loss of vision. They include a supposed "sixth" sense which is usually described as a sense of obstacles. Novelists have often pictured the blind as possessing unusual abilities such as being able to discern colors from the feel of objects, but most of these attributes are fiction and wishful thinking.

Important role of vision. The seeing person realizes only slightly how much he depends upon vision and at what a loss he is when deprived of it. He not only loses the ability to get around readily, but he can no longer observe how other people do things. The blind perform these same operations in many faulty and inaccurate ways.

G. Dumas [1] reported experiments in mimicry of the blind at the National Institution for the Blind in Paris. A total of thirty-three observations were made on congenitally blind persons in which they were asked to mimic strong or weak emotions, delight, great joy, anger, or fear. They were incapable of doing them because mimicry of this kind is entirely of visual origin and hence also of social origin. Mishchenko reports that the facial motor activity in the blind is reduced below that of seeing persons; asynchronic movements are more difficult for the blind than are the synchronic ones.

Absence of visual imagery. Visual imagery results from retaining or recalling what has been seen. It plays an important role in the lives of the seeing beyond the actual seeing itself. The blind are deprived of visual imagery experiences as well as the benefits of the immediate vision. Those born blind never have its helpful effects while those who become blind gradually lose most of their visual imagery in much the same manner as people of normal vision tend to forget many of their earlier experiences with the passage of time. Deutsch,[1] blind from birth, recounts that visual imagery never occurred in her dreams, but auditory imagery was most prominent. Dumas also reports that six children not born blind, but becoming blind before five years of age, had regular visual imagery in their dreams. Approximately sixty other children were mostly negative about visual imagery, with a few doubtful about it.

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[1] G. Dumas, "La Mimique des Aveugles," (Mimicry of the Blind), *Bulletin Academie de Medicin,* No. 107, 1932, pp. 607–610.

The blind tend to live in a world of temporal sequences rather than the spatial sequences of seeing persons. The seeing person plans his day in terms of the visual surroundings accompanying each activity or event. The blind person plans mainly that he does first one task, then a second, and a third, in whatever order they come. His associations are largely kinesthetic and auditory rather than visual.

Sense of obstacles. It has already been observed that some blind persons seem to possess a sense of obstacles. Many experiments have been performed to determine the exact nature of this "sixth" sense which seems to be quite mysterious. Dolanski [2] performed some very thorough experiments on it. Masks were put over the faces of the blind so that they could not feel any change in the air pressure from approaching objects. They could judge the presence of obstacles as well with the masks as without them but had less confidence in their judgments. When Dolanski covered their ears so that no sensations could be received through the ears, the blind could no longer judge obstacles accurately. Just how the ears could detect this approach was not discovered, except that it was believed they could pick up very minute auditory sensations. Other investigators attempted to explain this sense of obstacles as changes in the pitch of footsteps, differences in temperature. and other similar means. Hayes summarizes these various investigations and recommends further research along several lines.

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[1] E. Deutsch, "The Dream Imagery of the Blind," *Psychoanalytic Review*, 1928, **15**, pp. 288–293.

[2] W. Dolanski, "Les Aveugles possedent-ils le Sens des obstacles?" (Do the Blind Possess a Sense of Obstacles?) *Année Psychologique*, 1930, **31**, pp. 1–50.

Intelligence of the blind. The most extensive program of mental measurement has been conducted by Dr. Samuel P. Hayes. He collaborated with Robert Irwin in a Binet Scale for the Blind in 1923. Hayes's [1] efforts were completed further in 1930 by his publication of Terman's Condensed Guide for the Stanford Revision of the Binet-Simon Intelligence Tests Adapted for Use with the Blind. A survey of the various investigations shows that blind children test slightly lower than seeing children, at all mental levels, with fewer gifted and more mentally subnormal among the blind than among the seeing. As a group, the blind do not differ very significantly from the seeing in intelligence. Some very famous characters of history were blind as will be mentioned shortly.

In testing for special abilities and disabilities, Knotts and Miles [2] found the blind to be slightly superior to the seeing who were blindfolded in learning a maze test. Other maze studies show a great range of individual differences between the best and the poorest learners within both the blind and the seeing groups. The play of blind kindergarten children was found to be less constructive and more monotonous than that for the seeing. Blind persons are more accurate than the seeing in judging the direction of sounds, but their superiority was accredited to more practice rather than to natural superiority in this trait.

Brown [3] gave personality tests to more than two hundred blind students between the ages of sixteen and twenty-two years, and compared them with a somewhat larger number of seeing high-school pupils. The groups were found to be most neurotic in the following order: blind females, sighted females, blind males, sighted males. It is to be noted that females of both groups are more neurotic than males, and the blind were more neurotic, generally, than the sighted within each sex group. When the great handicap of blindness is considered it is surprising that the differences in neurotic tendencies are not much greater than this study shows.

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[1] S. P. Hayes, *Terman's Condensed Guide for the Stanford Revision for the Blind*, Perkins Institution for the Instruction of the Blind, Watertown, Mass., 1930.

[2] J. R. Knotts and W. R. Miles, "The Maze-learning Ability of Blind Compared with Sighted Children," *Journal of Genetic Psychology*, 1929, **36**, pp. 21–50.

[3] P. A. Brown, "Responses of Blind and Seeing Adolescents to a Neurotic Inventory," *Journal of Psychology*, 1939, **7**, pp. 211–221.

Informal observation discloses that the blind show great individual differences in their motivation toward success. At one extreme are found blind people who accept the challenge of blindness and rise to heights of great success in spite of the handicap. At the other extreme are a few who settle into a lethargy of helplessness, demanding that society should provide for them. However, approximately equal differences in motivation are also found, with much less reason, among seeing people. These differences in either the blind or the seeing lie in ambition, personality, character, and other factors which are somewhat difficult to measure and evaluate.

The Number of the Blind

It was stated earlier that the number of the blind was small. Just how small or how large this number actually is in the United States will now be discussed. There are some difficulties in securing an accurate count.

The Federal Government has always been interested in the number of the blind and beginning with the decennial census of 1830 has made a special listing of the blind and also of the deaf. The census authorities have always admitted that their figures are somewhat inaccurate, due to inadequate definitions of blindness and to an inexplainable reluctance of families to report blind relatives.

Table III gives the census data on the blind from 1830 to 1930.[1]

The number of the blind according to this report in 1930 was 63,489. The ratio to each million of the population is a comparable figure throughout the entire period. It would appear from this table that there were relatively greater numbers of blind in the latter part of the nineteenth century than

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[1] Bureau of the Census

TABLE III

THE BLIND IN THE UNITED STATES, 1830–1930

Year	*Number*	*Ratio 1,000,000 Population*
1930	63,489	517
1920	52,567	497
1910	57,272	623
1900	64,763	852
1890	50,568	808
1880	48,928	976
1870	20,320	527
1860	12,658	403
1850	9,794	422
1840	6,936	406
1830	5,444	423

before or after that time. The recent ratio of 517 would indicate that a city such as Philadelphia with 2,000,000 population would be expected to have 1034 blind people of all ages. There are two opposing thoughts with regard to the present number and prospective trends. On the one hand under the discussion of causes, remedies, and preventions, certain hopeful reductions in the blind are anticipated; on the other hand surveys from other sources show a much larger number than the census.

Recent additional surveys. It will be noted from Table III that in 1920 52,567 cases were reported. Shortly thereafter a survey made by the American Foundation for the Blind, Inc., reported 56,566 blind in only 17 of the 48 states, comprising about one-half of the total population of the country. This survey was made from the records of agencies known to have high reliability of reports. At the same rate for the entire country, the total number of the blind would be 114,000 or more than twice as many as the census data. The United States Public Health Service conducted a nation-wide survey in 1935–1936 and placed the number of the blind at 117,000.[1] This number agrees quite closely with those of the American Foundation rather than with the census data. It should be stated that the main purpose of the census surveys was to stimulate a more in-

[1] *Blindness—Amount, Cause and Relation to Certain Social Factors*, National Health Survey, 1935–1936, U. S. Public Health Service, Washington, D. C., 1938.

tensive study by other groups. With comparatively little additional time and expense the census succeeded well in this aim.

Blindness is an affliction mainly of adults, and particularly of old people. Various estimates place approximately one-half of the total number of the blind at sixty years of age or older. About 13 per cent of the blind are under twenty years of age which would indicate about fifteen thousand of school age. They constitute an important group of the blind with whose education teachers are primarily concerned. Only about six thousand of these fifteen thousand are to be found in classes and schools for the blind. It is evident that a full educational program for all blind children is not yet available. There are more blind men and boys than women and girls, and of every five blind persons there are approximately three males to two females.

From the discussions in the two preceding chapters, based on estimates by the White House Conference, 0.05 per cent of all children are blind. This number is one in every two thousand and is one-fourth as many as the partially seeing. Upon the same basis of school population and general population every city of eighty thousand general population or over should have at least one class of eight pupils. By sending children from smaller communities, either for boarding and rooming, or to be transported daily, cities of much smaller size could also have Braille classes. There are many cities of sufficient size who do not yet have any Braille classes.

Causes, Remedies, and Preventions

Two types of causes. There are two general types of causes, and all cases fall within both groups. The first type is known ① as the underlying cause or etiological cause. An accident fundam affecting or destroying the eyes would be an etiological cause. The second type of cause is the area or topographical cause ② such as destruction of the optic nerve from the etiological medic cause. This twofold classification of causes was recommended by a Committee on Statistics of the Blind in 1929 which was sponsored by several societies interested in the blind. For the general public the etiological or fundamental causes are of greater significance, while the topographical causes are primarily of medical concern, often related to surgery with delicate and involved operations.

In the present discussion emphasis will be directed chiefly to the etiological causes. However, parents of blind children and teachers of the blind are encouraged to learn about the topographical causes as well, so that they may carry out medical recommendations intelligently. Wherever classes for the blind are established there is usually close cooperation of physician, teacher, and parents in the welfare of blind students. The topographical causes are legally diagnosed by a physician, and preferably by a physician specializing in eye diseases and defects.

According to the 1920 Census the causes of blindness were as shown in Table IV.

TABLE IV

CAUSES OF BLINDNESS

Group	*Cause*	*Per Cent*
I	Disease	54.4
II	Accident	16.5
III	Other definite causes	2.6
IV	Indefinite causes	25.5
V	Combination of causes	0.9
	Total	99.9

In this table there is some mixture of etiological and topographical causes, but chiefly etiological.

Accidents as causes. Accidents cause from 15 to 25 per cent of blindness according to different authorities. Accidents take a big toll of blindness in play during childhood and in industrial accidents in early adulthood. Best [1] analyzed the census data on causes of blindness and found that accidents take first place among children and in adults up to forty-four years of age. After this age accidents are superseded by diseases as the chief causes. In general, accidents cause five times as much blindness among males as females. Explosions and flying objects exact a heavy toll among boys and men, whereas girls and women have blindness resulting from falls, burns, and cutting instruments. Best also furnishes tables in great detail showing causes by geographical areas and many other classifications.

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[1] H. E. Best, *Blindness and the Blind in the United States*, The Macmillan Company, New York, 1934, pp. 3–49.

The problem of preventing blindness by preventing accidents is a challenge to all of society. In the industrial world many safety devices are being developed to reduce hazards to the eyes, as well as to other parts of the body. The use of heavy goggles with shatterproof glass and with various colored lenses to reduce glare from chemicals and furnaces are hopeful signs. In the case of children and young people explosives from Independence Day celebrations have taken such a heavy toll that they are prohibited in many localities. When the great toll of blindness was added up it was obvious that the spirit of the Fourth of July should be expressed effectively in less dangerous ways. The reduction of blindness from accidents should also reduce the staggering total of 425,000 persons who are blind in one eye. The loss of one eye is more than a 50 per cent loss since it throws a heavy burden on the remaining eye which in turn may fail from overwork. Loss of one eye also destroys the fusion of images of the two eyes that ordinarily gives a sense of depth or third dimension. In other words, seeing with one eye gives a flat impression without distinguishing the form of objects. If a continuous intensive campaign is carried on for the reduction of accidents, authorities estimate that blindness from accidents could be reduced to one-fourth of the present number.

one eye

Diseases as causes. Although the census reports show 54.4 per cent of blindness caused by diseases, the number is probably greater than that figure, with more recruits from the group of indefinite causes (25.5 per cent). Two types of diseases cause blindness. One class is of a general infectious nature often affecting the eyes, the other is specific diseases of the eyes themselves. Among the general infectious diseases are measles, scarlet fever, typhoid fever, smallpox, diphtheria,

54.4%

15% [illegible]

① Infection

② Specific diseases

38+%

and meningitis, any of which may produce infections settling in the eyes, and having disastrous results. While none of these diseases alone accounts for a large number of cases of blindness, together they total 15.7 per cent of all causes. Dangers to the eyes from these diseases are now commonly recognized.

Specific diseases of the eyes themselves account for 38.6 per cent of all blindness, and the percentage may be higher from the indefinite and unknown causes. A few of these specific diseases will be mentioned. Babies' sore eyes, or *ophthalmia neonatorum*, resulting in blindness come from venereal infections of the parents. In 1884 a famous German obstetrician, Carl Siegmund Franz Credé, discovered that a small amount of silver nitrate used in a solution to bathe the eyes of newborn babies reduced the number of cases of sore eyes remarkably. This treatment had such wonderful results that all but three states now require its use. Jost[1] describes the provisions of these laws with the responsibility for their execution, and with a plea for more uniformity of regulations. Berens[2] reports that in 1908, 26.5 per cent of all children entering blind schools in the United States had *ophthalmia neonatorum* as the cause of the blindness, but in the next twenty-five years, up to 1933, this had been reduced to 7.0 per cent of the total.

Venereal diseases are also responsible for other conditions which destroy vision. Interstitial keratitis is an affliction of the cornea of the eye associated with syphilis in parents. Venereal diseases may occur in congenital or acquired forms and affect children or sometimes cause blindness in later years. Inflammation and wasting away of the eyes takes place, or this deterioration may affect other parts of the body and the brain as well. Frampton and Rowell[3] list venereal diseases separately from other diseases as causes of blindness and estimate that fully 15.0 per cent of all blindness is caused by them alone.

15%

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[1] A. C. Jost, "Prevention of Blindness from Ophthalmia Neonatorum," *The Sight-Saving Review*, 1939, **9**, pp. 126–149.

[2] C. Berens, "What Can an Organization for the Blind Do in Preventing Blindness?," *The Sight-Saving Review*, 1933, **3**, pp. 186–203.

[3] M. E. Frampton and H. G. Rowell, *Education of the Handicapped, Volume II, Problems*, pp. 115–178.

Farrell[1] reports that if all venereally infected prospective mothers could be given a Wasserman test and treatment administered before the fourth month of pregnancy that the venereal-disease problem affecting newborn babies would be solved.

There are so many other devastating effects of venereal diseases besides blindness that a few states have recently passed legislation requiring physical examinations to determine the presence or absence of such diseases before marriage licenses are issued. In Michigan the health authorities have already noted a downward trend in venereal diseases.

Trachoma is another disease of the eyes which causes blindness. It is also known as red sore eyes or granulated eyelids. Trachoma is associated with low living standards, poor nutrition, undesirable and unsanitary living conditions. Historically it has been known for many centuries. In China one million out of the total of four hundred million population are blind from trachoma and twenty million others have badly impaired vision from it. It has also been prevalent in Egypt and neighboring countries. Although government restrictions against immigrants afflicted with trachoma were passed in 1897 it had already found its way into the United States.

Trachoma spread into the mountainous regions of Kentucky, Tennessee, West Virginia, then across southern Illinois, Missouri, and adjacent areas in Arkansas and Oklahoma. It is also prevalent among Indians, with fully 20 per cent afflicted. The United States Public Health Service started a vigorous campaign against it in 1913 with temporary field hospitals at strategic points. Dr. John McMullen was a pioneer in this program which has gradually brought trachoma under better control. In eastern Kentucky the incidence of fifteen per thousand in 1915 was reduced to seven per thousand by 1930. Success of the program depends upon a long-time educational program for better living standards, in addition to specific treatment of the disease itself.

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[1] T. H. Farrell, "Some Causes of Blindness," *The Sight-Saving Review*, 1935, 5, pp. 108–115.

Glaucoma is another important cause of blindness, accounting for at least 5 per cent of the grand total. In a broad sense it includes a series of changes in the interior of the eyeball which increases tension or strain. Opaqueness develops, so that the rays of light cannot penetrate to the retina and to the optic nerve. Pressure also disrupts the external mechanisms of the eye. Some forms of the disease develop so slowly that the patient is not aware of the danger until it is too late. Its diagnosis is a medical problem and the duty of ophthalmologists.

Cataract is another important disease causing blindness. In the 1920 census report 13.7 per cent of the total were caused by it. Contrary to popular opinion, cataract is not confined to old age. Many children are also afflicted. Holloway [1] found that 15.7 per cent of 2702 children in 20 schools and classes for the blind had cataract. It renders the crystalline lens opaque, so that the light rays cannot pass through to the retina. In many cases the process is allowed to develop up to a certain stage of maturity, and the lens is then removed by a comparatively simple surgical operation. Soon afterward glasses are fitted which provide for the focusing lost from the lens so that vision is restored. There are many other diseases of the eye with each accounting for a small per cent of the total.

Heredity as a cause of blindness. The census data were not very specific about hereditary causes since families were often reluctant to divulge such information. In a sampling of the blind it was found that 11 per cent had blind relatives, either parents or children, or brothers or sisters. This occurrence is much more frequent than a similar sampling of seeing persons would be. Loeb [2] summarized the studies over a 50-year period on 1204 families with hereditary blindness and found that 2523 out of 4155 children or 60 per cent were also blind. This high frequency is definite and conclusive evidence that heredity is an important factor in blindness.

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[1] T. B. Holloway, "The New Statistics on Causes of Blindness Among Children," *The Sight-Saving Review*, 1935, **5**, pp. 13–25.

[2] C. Loeb, "Hereditary Blindness and Its Prevention," *Annals of Ophthalmology*, 1909, **18**, pp. 1–22.

Blindness and consanguineous marriages. Children born of parents who are closely related are ten times more liable to be blind than when there is no blood relationship. There is a similar tendency for other physical defects, as well as mental defects, to occur when the same family continues to intermarry. Sometimes these defects are in a latent stage for one generation only to reappear in the following one. On account of these known consequences, in some states marriages of relatives as close as first cousins are prohibited by law.

Other causes of blindness. There are many other miscellaneous causes of blindness, including old age, eye strain, paralysis, exposure to intense heat or cold, poisoning from alcohol, tobacco, lead, acids, dust, and cosmetics. Society pays a big toll in blindness with many preventable causes. Various authorities, including Best, estimate that 72 per cent of all blindness is preventable. It is the duty of society to be informed of these causes and take all possible steps, individually and collectively, to reduce blindness.

History of the Blind

Since the dawn of history the blind have been the subject of great attention and study. What has been said about them to this point and what follows has been the result of long and patient attempts to understand the blind. The history of the blind will be discussed with respect to their treatment in society, famous blind characters of history, the establishment of schools for the blind, and the evolution of teaching methods.

Treatment of the blind. The treatment of the blind in ancient times was a mixture of many motives and emotional feelings, often as irrational as primitive civilization itself. Sometimes the blind were regarded with awe and described as having supernatural powers. In other times they were put to death as helpless and dependent members of society who bore the curse of the gods. China used them to transmit history and tradition by word of mouth since there was little in the way of permanent written records. The blind were required to learn historical lore from older blind persons and later on were expected to pass it on to the younger blind of the next generation. Such a process upon a mouth-to-mouth basis over many generations must have resulted in very garbled and inaccurate accounts. Experimental work on the accuracy of verbal reports transmitted through several hands has showed that little reliability results from such a method.

Egypt was known as the country of the blind. Herodotus proclaimed the fame of noted Egyptian oculists. Early Hindu medical books from India listed many disorders of vision. As a class, the blind eked out a miserable existence by begging, and many of them continue to do so in modern times. During the Middle Ages the blind were placed under the care and supervision of monasteries as a result of more humanitarian treatment during the early Christian era. The Duke of Bavaria established a home for the blind in 1178 A.D., and attempted some kind of instruction. In 1254 A.D., a refuge for blind Crusaders, known as the Hotel des Quinze-Vingts, was established in Paris. During the next five hundred years various brotherhoods founded many other institutions for the blind throughout western Europe. Eventually these efforts lead up to the establishment of schools for the blind.

Famous blind persons. Throughout history many blind persons have become famous in spite of their great handicaps. Their example always serves as a great inspiration not only to the blind but to seeing persons as well.

The first famous blind person to be listed is the great Greek poet, Homer, whose *Iliad* and *Odyssey* have been masterpieces of literature throughout the ages. Didymus of Alexandria, who lived in the fourth century of the Christian era was famous as a teacher and theologian. He became blind at about five years of age, but resolved to show the world that the blind could become more than ragged and homeless beggars. He invented a system of letters which gave him the ability to read.

Born in 1682, Nicholas Saunderson rose above his handicap of blindness to become a mathematician and professor at Cambridge University. Soon afterward the blind John Metcalf became a successful engineer interested in road construction. Maria Theresia von Paradis of Vienna became so famous in music that she was pensioned by Empress Maria Theresa.

She met Valentin Haüy in Paris and many of his later accomplishments in helping the blind were inspired by her example. The famous poet, Milton, was among the illustrious blind.

Louis Braille (1809–1852), for whom the Braille system of reading and writing was named, lost his eyesight with a knife at the age of five years while imitating his father, who was a saddler by trade. He put out one eye and the other soon became blind from a type of sympathetic connection which occurs quite frequently. Henry Fawcett was a blind postmaster general and two United States senators, Gore and Scholl, were blind.

Braille

There have been quite a number of remarkable cases of blind-deaf persons including Laura Bridgman and Helen Keller. The discussion of these cases will be postponed until after the topic of deafness has been presented so that the full significance of their double handicaps may be better appreciated.

Establishment of schools for the blind. Many of these blind persons had made heroic efforts to acquire an education. A few attempts at education had also been made in the early hospices for the blind. The very significant and practical beginning of education for the blind is universally accredited to Valentin Haüy of Paris. His first pupil was François Lesueur, whom he found begging on the streets, in 1784. Soon afterward, twelve blind pupils were sent to Haüy's school and were supported by *La Société Philanthropique*. Haüy used a system of raised letters which the blind tried to learn from feeling with their finger tips. Soon afterward a school for the blind was opened in Liverpool in 1791. Others followed in Edinburgh and in Bristol in 1793, in London in 1799, and in most other European capitals before 1810.

Haüy

The movement soon spread to the United States. About 1825 most of the New England states authorized an enumeration of the blind. This interest gained so much momentum that, beginning with the Federal census of 1830, a special listing of the blind was ordered. In 1829 the Massachusetts legislature passed a law unanimously and without debate authorizing the establishment of a school for the blind. On the board of trustees were included the governor, lieutenant-governor, the president of the senate, and the speaker of the house. Dr. Samuel Gridly Howe was chosen to take charge, but first was sent to Europe to learn firsthand what had been accomplished by Haüy and others. In August, 1832, the school opened with six pupils and thus was started the famous Perkins Institution and Massachusetts School for the Blind.

Mass
school

The problem of financial support was closely related to the success of such schools. For them the Massachusetts legislature, in 1830, appropriated $1500, an unexpended balance from a previous grant to establish a school for the deaf. Soon afterward the legislature appropriated an additional $6000 so that twenty indigent blind children could be educated at state expense. Other states, as far away as South Carolina, began subsidizing this school so as to educate their blind pupils. The Perkins Institution also received many substantial private endowments.

Soon other states organized their own schools for the blind. In 1832 Dr. John Russ was placed in charge of the New York State school and state aid for it began in 1834. The Pennsylvania Institution for the Instruction of the Blind opened in 1833, with neighboring states sending some of their pupils. Ohio started a blind school in 1837, and Virginia started one in 1839 making it jointly a school for blind and deaf. By 1850 twenty-five states had schools, by 1875 ten more had been added, and at the present time every state either has a school or provision for its blind in a neighboring state.

In the meantime public-school systems of large cities realized that there were enough blind children locally to establish day schools or classes for the blind as a part of the public education program. Chicago was the first to organize a class for the blind in 1896, Cincinnati followed in 1906, Milwaukee in 1907. At the present time more than twenty cities have such classes which are known as Braille classes. These provisions for the blind are far short of the total needs. At the time of the White House Conference on Child Health and Protection in 1930 only about six thousand of the fifteen

Public
school
Chicago

thousand blind children were being educated either in public, private, or state schools. This is only 40 per cent of the total and, while disappointingly low, is considerably higher than the provisions for all other types of exceptional children.

History of methods of teaching. Throughout the history of civilization, up to about one hundred years ago, little progress was made in educating the blind because no satisfactory method was discovered for teaching them. It had been mainly through oral methods that the blind were able to learn. One of the first partially successful methods of learning by a system of crude reading symbols was devised about 1750 by Blind Jacob of Netra, Germany. He noted that seeing children learned by written communication so he set up a system of notches cut out of small sticks which was similar to the methods used by primitive peoples. He gradually collected quite a library of his own made entirely of these notched sticks.

A more profitable method had been tried by others by teaching the blind to read by tracing the outline of raised letters carved out of wood. Valentin Haüy gave this general plan a more practical turn when he devised and improved the use of embossed printing. The letters were made much larger than formerly and a type was cast so as to show them in regular rather than in the usual reversed order. His pupils began to learn by this method, particularly his first well-known pupil, François Lesueur. However, this method had its limitations. There is a marked gap between the keenness of the human eye in detecting the fine points in printed letters and the more cumbersome responses of the sense of touch in the finger tips to these same letters.

The intricacies of curves and minute niceties became a severe stumbling block for the blind, and soon modifications of letters were under way, chiefly in the direction of substituting straight lines, angles, or even triangles as symbols for letters. The most successful of these methods was devised by William Moon, born in England in 1817, and who became totally blind at the age of twenty-one years. He developed a system of linear symbols slightly resembling Roman letters, made out of wire and fastened to metal plates. The letters were made so large and so plain that even old people who had been blind many years took a new interest and found the system fairly easy to learn. For many years its popularity persisted and only by slow degrees did it give way to the Braille system.

Louis Braille was born in France in 1809. He was blinded by accident in early childhood and entered the Paris school for the blind when he was ten years old. He stayed on as an instructor but was always in delicate health and died in 1852 at the age of forty-three years. He reduced a system of twelve dots in a frame devised by another Frenchman, Charles Barbier, to six dots with two vertical rows of three dots in each row. Approximately sixty practical combinations of these dots are available without confusion as to position. Letter values were assigned to each combination, and other meanings were also attached to these same combinations, usually three in number. For example, the first line of ten characters had the first ten letters of the alphabet, A through J, the numbers 1 to 9 and 0, and a series of ten common words. The third symbol, consisting of the two top dots in each row, stands for the letter C, the number 3, and the word can. These dots were indented in a stiff paper, and could also be written by the pupil with a suitable frame and stylus, but done in reversed order. With some slight additions and minor changes this system of Braille is in general use today.

Current Trends in Teaching the Blind

Inasmuch as the Braille method is somewhat complex, it inevitably follows that children of differing levels of mentality also vary in their mastery of it. Brighter pupils learn more rapidly, and are able to scan quickly over whole words or phrases, similar to the characteristic reading of seeing children. The mentally slow struggle with each letter, forgetting the earlier parts of words and losing the train of thought from one word to the next. By the use of photographic records of finger movements, Fertsch[1] found that good Braille readers move their hands much more effectively in regressive movements and in making returns to the beginning of the next line. Reading habits become established in about the third grade with little change thereafter.

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[1] P. Fertsch, "An Analysis of Braille Reading," *Outlook for the Blind*, 1946, **40**, pp. 128–131.

It was more than fifty years after Edison invented the phonograph and suggested its use for recording books for the blind that the idea was put into effect in 1932 by Robert B. Irwin, blind director of the American Foundation for the Blind. Lowenfeld[1] reported in 1945 that there were more than 30,000 Talking Book reproducing machines in use and although only one-fifth as many titles were available as for Braille the demand for the former was greater. The invention and use of wire and tape recorders may also enter this field. Lowenfeld reports that at the sixth and seventh grade level the Talking Book rate is two and one-half times faster than Braille reading.

Committee on sensory devices. In a chapter in Zahl,[2] Corner reports on the activities of the Committee on Sensory Devices composed of six eminent men from the fields of physics, physiology, otological research, psychology, and embryology who outlined and undertook research in: (A) devices for reading ordinary print by the totally blind; (B) guidance device for ranging and obstacle finding; (C) optical magnifiers to aid persons of limited visual acuity; and (D) improvement of the "Visagraph," a machine for the production of enlarged embossed images of print, diagrams, etc. Some progress has been made in all four of these areas with encouraging progress in development of the "Optophone" designed to translate ordinary printing into sounds which might eventually supersede Braille and Talking Books.

Federal assistance. In 1879 Congress first allotted an annual subsidy of $10,000 to the American Printing House for the Blind to provide textbooks for Schools for the Blind. In August, 1946 the appropriation reached $1,125,000 annually for replacement and maintenance. The American Printing House continues to be subsidized by the Federal Government so that its output may continue to be available. The Post Office Department allows free postage for reading matter for the blind to encourage their cultural activities. The Library of Congress acts as a clearinghouse for books for the blind.

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[1] B. Lowenfeld, *Braille and Talking Book Reading: A Comparative Study*, American Foundation for the Blind, New York, 1945, 53 pp.

[2] P. A. Zahl, ed., *Blindness*, Princeton University Press, Princeton, 1950, 576 pp. (pp. 431–442).

Higher educational costs. It is much more expensive to educate blind pupils than seeing ones. Classes must be quite small, since pupils need much individual attention, and there are frequently not more than six or eight to a teacher. It has already been noted that books and equipment are very expensive. The White House Conference [1] reported that annual per pupil costs in public-school classes ranged from $120 to $590 in different cities. Costs of complete maintenance in state or private schools would naturally be much higher. These additional costs over the education of nonhandicapped pupils are defrayed in part in some states by special state aid to the handicapped.

Organizations interested in the blind. In a general sense all society is interested in the blind. The blind arouse sympathies and their plight stimulates helpful action. Many organizations and associations have given practical aid and have aroused community sentiment for effective legal measures. It has been noted previously that most state governments have established schools for the blind or made provision in neighboring states. Many local school systems have provided classes or schools. The Federal Government has aided the blind by listing them in the census since 1830, by giving free mailing privileges for certain types of their books and newspapers, and by subsidies to aid in printing material which otherwise would be too expensive to be done by private means.

There are two important national organizations interested in the blind, The American Foundation for the Blind and the National Society for the Prevention of Blindness, both with headquarters in New York City. The International Council for Exceptional Children, with a large membership of supervisors and teachers of all types of handicapped and exceptional children, is active in promoting the education and welfare of the blind.

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[1] The White House Conference, *Special Education: The Handicapped and the Gifted*, pp. 243–274.

Many of the luncheon clubs, including the Kiwanis, Lions, Rotary, and Exchange Clubs, are interested in handicapped children. These organizations exist in the large majority of cities of over a few thousand population and are composed of men in important business and professional positions. They concern themselves with many phases of the blind and other types of exceptional children, including better educational, recreational, and camp facilities. Some of the state programs for auxiliary educational aid have been successfully sponsored by these organizations working through the state legislatures. All have been very helpful in advancing the general welfare of blind children.

Problems of the Adult Blind

Although this book is primarily concerned with exceptional children their adult adjustments are an important secondary interest and closely related to problems of educational and vocational guidance. A few problems will be discussed briefly.

The induction of the blind into vocational positions integrates closely with their later years in school. The League for the Handicapped carries on a program of vocational training and placement. Bureaus for the rehabilitation of physically handicapped civilians are financed equally by Federal and state funds in practically all states. These bureaus are administered under the state boards for vocational education and are associated with state departments of public instruction. Candidates over sixteen years of age with physical handicaps, if capable of becoming self-supporting, may benefit from the bureaus' services. The program includes physical and psychological examinations, assistance in securing corrective appliances, physical restoration, vocational guidance, counseling and training, aid in securing suitable employment, and social followup. Service is available through traveling agents from the central office or from branch offices in the principal cities. Adults who have physical disabilities may be referred even though they may have never attended school in the local systems. The handicapped are sponsored by the bureaus which, through their contacts with business and industrial firms, are able to place many in useful and suitable employment.

Workshops for the blind. Workshops for the blind were first established about one hundred years ago mainly for charitable reasons. There is a great variety of projects in these many workshops, ranging from simple to complex machines and operations. In the face of all of these opportunities it continues to be difficult for the adult blind to be self-supporting.

The Federal Income tax allows a second personal exemption for blind adults and a third one for those who are over sixty-five years of age. Deductions are also allowable for expenses incidental and unique to blindness. The Social Security Act now provides a Federal monthly grant of twenty-five dollars to any blind person. The State in which he lives will provide the balance, up to a total of forty-five dollars per month, including both Federal and State grant. At present about 80,000 blind people receive a total of $3,000,000 monthly under this plan. There are some objections that such grants remove the incentive to work and hence a better plan will probably be developed.

The dangers and hazards of modern traffic have multiplied the problems of the blind in the past twenty or thirty years. In some localities there has been a movement recently for the blind to carry white canes with red bottoms. Motorists are required to give them the right of way, but some are not observing enough to notice the canes or may be uninformed about what they signify. Even with these limitations many of the blind find such canes very helpful in getting about.

Another recent development has been leader dogs for the blind. These dogs are quite expensive to breed and train, and those who are to use them are also required to take training in how to handle them. The training for the dogs is very rigid because they have to be very alert to their task in all situations and at all times. For example, steps on or off the curb must be observed as well as any sudden changes in level or pitch of any surface, water puddles, and hundreds of minor obstacles which seeing persons avoid subconsciously. The dogs must also observe whether low hanging obstacles such as wires, trees, and areas blocked off by chains which are entirely above their own heads would not be cleared by their blind companions. They must also be trained to disregard other persons who might call them away, and particularly to pay no attention to other dogs. It is reported that the most difficult task of all is to train them so that they will not chase cats, particularly those that are running away from them. Even with these difficulties most of the uses of such dogs have been highly successful and if ways can be found of financing the expense they may become much more popular with the blind.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Discuss orally or in writing any firsthand experiences which you have had with any blind persons, interpreting them in the light of problems discussed in this chapter.
2. Discuss why any arbitrary definition of blindness such as $20/200$ or poorer is not a practical means of classification.
3. Describe orally or in writing how the daily experiences of a blind and a seeing person differ significantly.
4. Make a thorough, complete report on Hayes's studies of the intelligence of the blind.
5. Select some special phase of the number of the blind as discussed in Best's *Blindness and the Blind in the United States.*
6. Discuss some of the other minor eye diseases as described in Posey's *Hygiene of the Eye.*
7. Discuss some other famous blind people, including contemporaries, with their accomplishments.
8. Make a report on talking books and talking-book machines, how they operate, where they may be obtained, and their probable value.
9. Make an enlarged set of Braille characters and explain the characteristics of different grades, such as Grade 1½.
10. Make contacts with the local luncheon clubs to learn firsthand what any of them are doing for blind children in the community and report to the class.
11. Visit a state school for the Blind and a Braille public-school class or school.

Chapter VI

DEFECTIVE HEARING

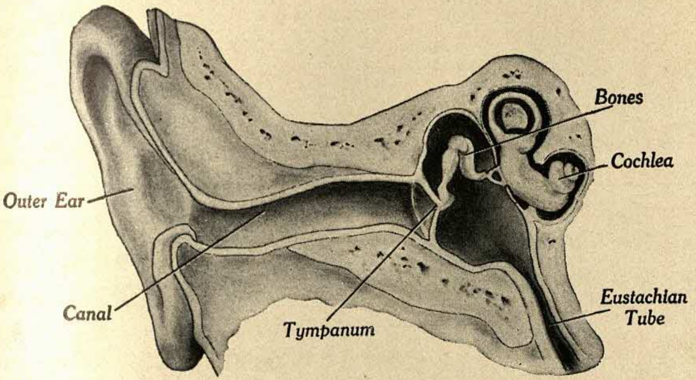
The same general plan of presentation for defective hearing is to be followed as that used for defective vision. The present chapter will deal with general problems of defective hearing. It will be followed in Chap. VII by a discussion of more severe hearing defects commonly known as the hard-of-hearing, and Chap. VIII will be devoted to the totally deaf. By this plan it is possible to proceed from the child with normal hearing to the slightly defective, to the hard-of-hearing, and to the totally deaf.

The Significance of Hearing Defects

In the case of visual defects it was noted that a very much larger number of children had defective vision than is ordinarily believed. The same condition is also true of hearing defects, but it is less noticeable on the surface because very few children wear or use hearing aids. The number of cases of defective hearing is also large as the evidence will show.

When a child does not see well he frequently makes his defect known by straining his eyes, holding his book close to his face, and various other obvious adjustments. However, the child with defective hearing seldom makes as much visible effort to hear by coming closer, by holding his hand up to his ear, or by other appropriate behavior. Instead of trying, he merely tends to let things go unnoticed or makes no response. This type of behavior has some other consequences besides lack of hearing.

The first conclusion drawn by those associated with him, both at home and in school, is that he is careless, indifferent, and impolite, because he pays little attention. He is suspected



The human ear.

Courtesy Independent School District of Dallas, Texas

Electronic equipment used in the instruction of hard-of-hearing pupils in the Independent School District of Dallas, Texas.

of having an inadequate personality and poor training in manners. The nature of his hearing defect may be such that some days he hears better than others, and hence hearing defect is not suspected. He may hear voices or sounds better at some pitch or tone level better than others, some voices are more distinct to him than others. For many reasons his actual difficulty is overlooked. In addition to his hearing defect he is characterized as being a poor citizen of the school as well as in his circle of acquaintances. He begins to suffer from a twofold type of handicap which makes his problem more grave in some ways than a single type of defect such as poor vision. It should be mentioned, however, that vision defects also produce some such secondary characteristics, but usually with different emphasis.

There is another secondary type of suspected defect which often accompanies undetected loss of hearing, namely, mental limitations. It is concluded that the reason why a hard-of-hearing child does not answer is that he is a mentally defective, and hence does not comprehend what is asked of him. Subconsciously or otherwise, there is a tendency to overlook him in school, and at home to favor those with more talented mental powers and abilities. Under these circumstances he gradually becomes used to neglect and slowly withdraws from the best of which he is capable. It is to be noted that the modern school is developing more favorable attitudes toward mentally slow and retarded children. The confusion of a hearing defect with limited mental ability also operates in the reverse direction so that the mentally handicapped are sometimes excused as having defective hearing. These costly mistakes are now slowly being brought to light and corrected by modern methods of physical and mental examinations.

There is an important lesson to be learned from the confusions just mentioned. Defects of various types seldom exist alone in any individual, but are frequently accompanied by a second defect or disability. This statement does not imply that all children with defective hearing have personality deviations or mental inability, although a small proportion of them have such combinations. In studying exceptional children the most fruitful point of view is that the whole child with all his characteristics, with his defects, as well as favorable qualities, should be evaluated so as to develop him to the best of which he is capable.

The Number of Auditory Defects

The Federal census has been making special listings of the deaf, beginning in 1830. In round numbers the number of the totally deaf approximately equals the number of blind, or about fifty thousand persons. Other agencies and organizations have been active in gathering more accurate surveys of the deaf and the hard-of-hearing. A Committee on Hard of Hearing Children of the American Federation of Organizations for the Hard of Hearing reported in 1926 that 14 per cent of pupils have hearing defects, amounting to at least three million children of school age. This number is about two-thirds that of children with vision defects, in which 20 per cent was the estimate. Whether the estimate is entirely correct or not, it is probably close enough to the real facts to show that impaired hearing is a problem of great magnitude. It would be approximately equal to the entire population of a city like Chicago and would equal the total population of several states.

In any regular classroom there would normally be at least five out of thirty-five pupils with some hearing defect. In comparatively good residential areas there are probably less than five, but in other more unfortunate localities the number is more than the expected average of five. Such a project as a Gallup poll of the average citizen's estimate of the number of defective-hearing cases would undoubtedly fall far short of actual numbers. This shortage would also be true of all other types of exceptional children. It may be a wise social provision for the morale of a nation to believe that all its citizens, including its children, are practically free from mental, physical, and social handicaps. However, this attitude cannot safely be shared by the schools, or by the social and health agencies who must know the facts and make adequate provision for the needs.

The Structure of the Ear

As in the case of the human eye, the ear is a marvelous mechanism designed to interpret what would otherwise be a world of deathly silence. It would be a world in which communication would be very difficult; it would be a world devoid of intelligence and meaning, if there were no hearing at all. Through the ear and its mechanisms of hearing, all of these gifts are provided with a high degree of perfection in the great majority of people. It is only when it is impaired or entirely lost that its real significance is appreciated.

There are three principal parts of the ear: (1) the outer ear; (2) the middle ear; and (3) the inner ear. The outer ear is the most obvious portion but is relatively the least important, having as its main function to conduct sounds into the other portions of the ear. The outer ear, or pinna, is a shell of cartilage shaped in such a manner as to gather up sounds and direct them into the auditory tube or meatus. The middle ear consists of an eardrum, or tympanum, which vibrates from the sound waves of the outer ear. In the air chamber of the middle ear is suspended a chain of three tiny bones, known popularly as the hammer, anvil, and stirrup. One end of this chain is attached to the tympanum and the other is attached to the inner ear to which is transmitted the vibrations from the tympanum. This chain of bones is designed to "step up" or intensify the vibrations from the outer ear. In order that the tympanum may vibrate freely there is an air passage from the middle ear to the throat, known as the Eustachian tube, so that air pressure may be equalized on both sides of the tympanum. When this tube is clogged from colds affecting the throat, the free passage of air is retarded, and hearing becomes muffled and indistinct.

The inner ear contains the most important and vital organs of hearing, housed very deeply in the skull bones. These inner passages terminate in a spiral known as the cochlea in which the end organs of the auditory nerve are embedded. Vibrations of the liquid in these passages stimulate the auditory nerve so that hearing takes place. In the liquid of the semicircular canals there is located the mechanisms of balance which gives an awareness of being erect or in other positions, a mechanism which is exceedingly valuable to aviators.

If any or all three portions of the ear are defective, or become incapacitated through disease or injury, hearing becomes impaired. These conditions will be discussed in more detail in later chapters among the causes of being hard-of-hearing or totally deaf. It may be judged from this brief description of the mechanisms of the ear that there are many possibilities of hearing loss. It would hardly seem necessary to note that such obvious obstructions as accumulations of wax in the outer passage are frequent causes of reduced hearing. Diseased conditions of tonsils and general throat infections which block the Eustachian tube also contribute their share to loss of hearing. Such conditions may be relieved and hearing be restored to a normal state, since there is no organic defect in the ear itself.

The changing demands upon the ear in the modern era of the past one hundred years have probably not been so strenuous as the demands upon the eye, although there have been many changes. In the early days of civilization, as well as for savages in the jungle, hearing played a very important role since it was seldom possible to see many of the dangers. Under present conditions of life in the open, the ear is of less importance in interpreting the physical environment. However, it must now attune to sounds of different frequencies, to the whir of speedy and noisy machinery, to the jumble and confusion of sounds in boulevard traffic. It must listen more intently to rapid and confusing conversation at greater rates and with more complex vocabularies than ever before. Talking movies and the universal use of the radio have added new significance to hearing and to listening. A few modern movies have special hearing-aid equipment for the hard-of-hearing. The whole matter of what is heard today and what may be heard in the future is worthy of further study. A very large proportion of the population of the entire world has recently been hearing the noise and din of total war.

Symptoms of Hearing Defect

There are many symptoms of hearing defect which may be detected without the use of refined instruments, although the latter are strongly recommended as a means of final diagnosis. Some of the symptoms listed below are also characteristic of other defects and should be evaluated with respect to those possibilities.

I. *Physical Symptoms*

Failure to respond, says "What?" constantly, cups his hand to his ear, moves closer, has peculiar posture, tilts head at unusual angles to get better sound, mouth breathing, running ears, earaches, and noises in head.

II. *Speech Symptoms*

Defects in speech, peculiar voice often high pitched and without expression, avoids talking to people, lack of adequate flow of language.

III. *School Symptoms*

Poor general scholarship, poor oral work, generally slow and inaccurate in schoolwork, particularly poor in spelling where dictation methods are used, puts his own incorrect interpretation on many questions and topics as a substitute for complete hearing and understanding.

IV. *Social Symptoms*

Listless, uninterested in any group, sensitive, aloof, suspicious, hard to accept as a cordial acquaintance.

Informal and Formal Testing

Hearing is usually judged in terms of how weak or how strong or loud sounds must be in order to be heard. There are other qualities of hearing in addition to sensitivity which should also be taken into account in a complete examination of hearing loss. The whisper test consists of whispering simple numbers behind the child, first in one ear and then the other, with the numbers to be repeated by the child. The purpose of being behind the child is so that he cannot read the lips of the examiner. Listening to a *watch tick* or the clicking of two coins together may also be used as very informal methods but their tone is much above the usual range of hearing for the conversational voice.

A more formal method is to examine each ear separately with the spoken voice. The pupil is placed with first one ear, then the other, toward the examiner who stands on a line marked off every foot up to 20 feet. A wad of cotton batten or a suitable plug of rubber is placed in one ear so that only one ear hears at a time. In sidewise position lip reading is impossible. The examiner speaks in an ordinary tone, asking simple everyday questions suited to the child's age and interests. The examiner starts at a distance of 20 feet and if the child does not hear he comes closer, foot by foot, until hearing occurs. A similar procedure is followed with the other ear. Results are recorded for each in terms of the fractional part of the 20 feet, such as 8/20, which is interpreted as hearing at 8 feet what should be heard at 20.

In recent years another method of hearing examination is the group use of the 4-C audiometer. Entire classrooms of children may be examined at a time. Early primary grade children may be examined successfully if limited to smaller groups. Each pupil is fitted with a pair of earphones and provided with pencil and paper. The audiometer transmits the human voice from an instrument similar to a victrola, adjusted to gradually diminishing degrees of loudness. Numbers are spoken from the audiometer first into the right ear, then the left ear, and each pupil records what he hears. The record first has a woman's voice and then a man's, so that four tests are available. By scoring the papers it is possible to determine at what point the hearing is no longer functioning satisfactorily. The numbers are of short span so that failure should not be due to mental inability. A few pupils do not respond well on account of the novelty of the task, or from excitement. Whenever a pupil fails he may be re-examined a few days later and possibly be more successful on this second trial.

If for any reason there is evidence of quite defective hearing, further examinations should be administered individually by an experienced technologist with a more elaborate type of audiometer. Three of these more recent types of audiometers include the Western Electric 6PB, the Sonotone model 20, and the Maico D-9. From time to time newer models appear and usually they are designated by higher numbers or by later letters of the alphabet. The final judgment as to deafness, degree of hearing defect, or to diseases affecting hearing should always be in the hands of a competent physician known as an aurist or otologist.

The methods of testing hearing which have just been outlined deal mainly with only one aspect of hearing known as sensitivity (the strength or weakness of a sound). Hearing also has the quality of pitch (recognition of high and low tones), as well as pitch discrimination (the ability to pick out certain sounds and react to them). It possesses tolerance (the recognition of whether sounds are harsh and irritating or soft and pleasing.

Lip and Speech Reading

Lip reading is a method of understanding and communication based upon reading the lips of one who is speaking. It has been used for many years in certain schools for the deaf, with very satisfactory results. More recently it has also been used with the hard-of-hearing who make rapid progress by combining some hearing with the visual impressions of lip reading. In view of these successes a few school systems give part-time instruction in lip reading to children with milder hearing defects who are enrolled in regular grades. A special teacher trained in lip reading takes small groups of children for two or more class periods per week in the regular schools. By this method the teacher can instruct a large number of children each week with a minimum disruption of time schedules and transportation costs. Speech reading is a more refined method which supplements lip reading by giving close attention to the speaker and by being able to fill in many sounds missed in lip reading.

Special education is not limited to large city school systems with separate classes and schools for all types of the exceptional. In a small school system, a teacher with training in methods of lip reading could teach part time in some regular subject and part time in lip reading. In a somewhat larger system she could give full time to lip reading even though there were no special hard-of-hearing or deaf classes in a central location. In a very small system or in a one-room rural school, a teacher with training in lip reading could teach the regular program, while devoting a few minutes per week to the few children who would profit from lip-reading instruction.

There are many other fields of instruction besides lip reading which could be so serviced. In this manner a much greater number of exceptional children could have the benefit of special methods adapted to their needs. The chief obstacles to such programs are ignorance about the needs, lack of specific training in special methods by regular teachers, and general inertia in putting the programs into effect.

The following suggestions for the guidance of the regular teacher are offered in the Michigan bulletin,[1] *Helping the Exceptional Child in the Regular Classroom.*

1. Encourage the child to make a study of speech reading (lip reading).
2. The teacher should speak distinctly to the child.
3. Stand where the child can see the movement of your lips easily.
4. Give attention to the correction of speech defects or incorrect pronunciation of words.
5. Make greater use of visual materials.
6. Provide an opportunity for the child to participate in the activities of his group in such a way that he may see the lips of the other pupils.
7. See that the child's customary seat is in the front of the room near the window.
8. Arrange for the correction of vision defects. (It is difficult to read lips with poor vision).
9. Urge the child's parents to speak distinctly and to stand so that their lips can be seen by the child.
10. Consider with parents the feasibility of individual hearing aids for children who have serious hearing losses. Such individual hearing aids should only be purchased on the recommendation of an otologist.

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[1] F. E. Lord, *Helping the Exceptional Child in the Regular Classroom,* Bulletin No. 315, Superintendent of Public Instruction, Lansing, Mich., 1941, p. 21.

It has been said that many times the difference between success and failure is a very narrow margin. This is probably true of children with mild hearing defects. The application of the various methods discussed in this chapter to more than two million children would work wonders not only for their happiness individually but for the greater good and efficiency of society as well.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Prepare a more detailed diagram of the ear than is shown in the text. Give suitable explanations.
2. Describe cases of hearing defect which you have known personally with their symptoms and characteristics.
3. Describe any other methods of informal diagnosis with which you are familiar.
4. Which do you believe is a more serious handicap, lack of hearing or lack of vision of the same degree? State your reasons.
5. Describe any changes in your opinions about hearing handicaps from the discussion of this chapter.

Chapter VII

THE HARD-OF-HEARING

The hard-of-hearing comprise a group between those mildly handicapped in hearing, and the totally deaf. In childhood, they are so handicapped that the regular methods of teaching do not adequately serve their needs. In spite of this fact there are thousands enrolled in regular classes with great educational loss to themselves and to society. Many suffer from the misinterpretations mentioned in the preceding chapter, being mistaken for antisocial behavior problems, or for the mentally retarded. Some are unaware of their defects and merely assume that everyone's hearing is supposed to be at that level.

Classification of Hearing Loss

There are many variables to be taken into account in classifying hearing loss in children. They include the four different qualities of hearing listed in Chapter VI, the general mental alertness of children, the stimulation from their home background, and similar factors. Classification is also made partly in terms of the decibel which is defined to be approximately the difference in amount of intensity that an ear can detect between the intensity of two sounds which are almost indistinguishable from one another. Decibels are ranked from low numbers to high according to intensity, with a faint whisper being about fifteen decibels, average speech about sixty decibels, and one hundred forty decibels for the largest air-raid siren at a distance of one hundred feet.

For practical purposes O'Connor and Streng[1] suggest four groups of children according to hearing loss. Group A has children with slight hearing loss up to 20 decibels and hence they can make a fair adjustment in regular classes if allowed special privileges as to seating. Group B with 25 to 50 or 55 decibels loss in the better ear in the speech range show need for help either in lip or speech reading classes or possibly in the hard-of-hearing classes. Group C with 55 or 60 to 65 or 75 decibels loss may profit from hard-of-hearing classes with hearing amplification so as to take advantage of lip or speech reading. Group D with 70 to 75 decibels loss are unable to have practical hearing of speech and language so that they must be taught by methods applicable to deaf children.

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[1] C. D. O'Connor and A. Streng, *Teaching the Acoustically Handicapped*, in *The Education of Exceptional Children*, National Society for the Study of Education, Forty-ninth Yearbook, Part II, Chicago, Ill., 1950, pp. 152–175.

Elwood A. Stevenson states the distinction between the deaf and the hard-of-hearing as follows:

> A deaf person—though many times, say six cases out of ten, possessed of sound perception—is one who *does not react* understandingly to spoken language. A hard-of-hearing person is one who reacts to spoken language understandingly, provided the source is brought within his hearing range, either through a loud voice, through amplification of sound, or through some other mechanical device. A deaf person may have 20 per cent of sound perception, but nevertheless he does not understandingly hear spoken language. A hard-of-hearing person may have only 5 per cent of hearing, yet nevertheless he hears understandingly.[1]

For the moment it might seem that such fine distinctions are of little importance, but they are actually very significant in planning the education of those with hearing defects. The education of the deaf must proceed without the immediate aid of spoken language, and language must be developed by other means as noted in the preceding chapter. On the other hand, the hard-of-hearing may use speech and impaired hearing as the bases of learning.

The next problem is to determine the upper limit of hard-of-hearing conditions. In considering this general limit it should be recalled that degrees of impaired hearing tend to follow the frequency distribution. This distribution shows an expectation that a small number are deaf, a greater number are hard of hearing, a much larger number have slight hearing loss, while the great majority have normal hearing. At the other extreme there is a small number who have hearing better than average and a very small number have extremely keen hearing. The immediate problem is the boundary line between the hard-of-hearing, as a class, and those with slight impairment of hearing. This limit is analogous to the boundary between sight-saving pupils and pupils of low vision in the regular grades.

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[1] M. E. Frampton and H. G. Rowell, *Education of the Handicapped, Vol. II, Problems*, p. 218.

Methods of Diagnosis

For the detailed examination of hearing loss one or more of the several models of newer audiometers mentioned in Chapter VI are generally used. Each ear is tested separately, with three trials at each of the points on the scale from low to high tones. There are separate testings for air conduction and for bone conduction. The results for each of these readings are recorded on an appropriate blank showing the loss of hearing from 0 to 120 decibels, with the average of three readings at each point being converted into the per cent of 120 decibels. As a general guide, pupils with from 35 to 50 per cent loss or greater are admitted to hard-of-hearing classes. In the final analysis each case is decided upon its individual merits, including general health, learning ability, present mastery of subject matter, and similar factors.

The final decision is made after all possible corrections by way of removal of wax from the ears, tonsil and adenoid operations, and other etiological conditions which may affect the hearing, have been corrected. Some candidates are often examined in this manner several times, especially in those cases in which admission is at first doubtful, but later confirmed, with the hearing loss becoming more marked.

For those who are better than this level of admission but who, nevertheless, have considerable loss of hearing, lip-reading classes are recommended. These classes are located in regular schools, both elementary and high, and are taught by specially trained teachers. The pupils come one or more times per week as described in the preceding chapter.

A somewhat more informal method of hearing *inspection* is to measure the hearing of the conversational voice for each ear separately at the distance of 20 feet, which is normal, and ranging down to whatever close distance is necessary. This testing is done with materials suited to the interest of the pupil, and with the examiner's lips hidden from the pupil so that lip reading cannot be used. Any hearing loss less than 20 feet is a cause for further complete examination by audiometers as noted above. If a pupil shows no loss on the audiometer, there are probably other reasons such as limited mentality or strangeness of the situation which caused him to fail in the informal testing.

Characteristics of the Hard-of-Hearing

There are a few characteristics of the hard-of-hearing which distinguish them from other types of the exceptional as well as from those whose hearing is more nearly average or normal. Sterling and Bell [1] examined the hearing of 1860 school children between the ages of eight and seventeen years in Grades 3 to 9, by means of an audiometer. They found a greater percentage of children with hearing loss among the older rather than among the younger, and more boys than girls with defective hearing. Except for boys about twelve years of age there was a strong tendency for the hearing to be better in the left ear than in the right. Hearing loss seemed to be greater among those overage for their grade, among those doing poorer work, and for those with low I.Q.'s.

A somewhat similar finding was reported from testing in India by Banerjee,[2] who examined approximately twenty thousand college students over a period of ten years. Generally the acuity of the left ear was more pronounced. He also found that hearing seemed to reach its maximum effectiveness at about the age of twelve years, which is before the maximum bodily development is reached, and then declined slowly.

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[1] E. B. Sterling and E. Bell, "Hearing of School Children as Measured by the Audiometer and as Related to School Work," *U. S. Public Health Report*, 1930, **6**, pp. 1117–1130.

[2] M. N. Banerjee, "Disparity in Binaural Acuity," *Indian Journal of Psychology*, 1931, **6**, pp. 125–141.

There is a general trend for older persons to become rather hard of hearing. This is believed to be due to greater rigidity of the basilar membrane in which the auditory nerve is encased. Kompanejetz [1] had the unique experience of measuring the hearing of a man one hundred sixteen years old whose hearing was only slightly reduced, with more loss in the lower tones than in the higher parts of the scale. This result is somewhat at variance with the usual theory that the higher tones are more likely to be affected in old people on account of greater rates of vibration and consequently with greater chance for deterioration. These are technical matters in the field of physiology and somewhat beyond the present interest.

A few studies have been reported on the elements of absolute hearing. Chiloff [2] names three indispensable elements for absolute hearing, viz., the determination of timbre, the standardized tone, and tonal memory. Even musicians, who were supposed to be able to recognize tones, made many gross errors when tuning forks were used. None of them showed absolute hearing, but they were considerably better than nonmusicians. Fatigue of the ear for certain sounds was found to occur surprisingly early, or in from 5 to 6 seconds for a tuning fork with 128 vibrations per second. Hysterical and neurasthenic patients fatigued in about one-half of that time.

Although the human eye is a very delicate organ it is much more accessible for the study and analysis of its physiology than is the ear which is encased in the bony structure of the skull. The semicircular canal in which the basilar membrane is housed, and which contains the auditory nerve, is very inaccessible. Just what portions of the auditory nerve are susceptible to high or low tones or how volume affects the nerve are matters of further physiological speculation. One observer noted that when the right hemisphere of the cerebrum was removed, the hearing in both ears continued to be approximately equal. Controversy also centers around how much hearing is possible by bone conduction through the skull from one ear to the other, when one ear is otherwise blocked from normal hearing. Other investigation has centered around the idea that the cochlear spiral is a Cartesian logarithmic spiral, and hence it may be that the ear rather than the brain analyzes sounds and perceives harmony. These are somewhat technical questions, beyond present interests, but indicative of the highly intricate mechanisms of the human body.

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[1] S. Kompanejetz, "The Hearing of a 116 Year Old Man," *Monatschrift für Ohrenheilkunde*, 1932, **66**, pp. 470–472.

[2] C. L. Chiloff, "The Elements of Absolute Hearing," *Acta Oto-Laryngolica*, 1930, **14**, pp. 382–392.

Personality traits. In a personality study Madden [1] had teachers rate hard-of-hearing and normal-hearing children who were matched as to intelligence, sex, age, and race. There were no differences between the two groups in attentiveness, obedience, and social attitude, but the hard-of-hearing were rated lower in leadership, definitely lower in aggressiveness and in shyness.

Pintner [2] compared over a thousand hard-of-hearing with normal-hearing children from the upper elementary grades on results with the Pupil Portraits Test. He found that the boys who were hard of hearing tended to rate themselves somewhat lower than the normal-hearing boys. There was only a very slight difference between the two groups of girls. It was probably more significant that those with slightly defective hearing made scores practically the same as did the normal-hearing: the more extreme the handicaps, the greater the differences.

The same author summarized various studies and investigations of personality and concluded that the differences between the hard-of-hearing and the normal-hearing are very slight. The hard-of-hearing are somewhat more introverted and slightly less well balanced emotionally. The younger hard-of-hearing tend to be somewhat more dominant than the normal-hearing, but as they grow older they find less satisfaction in dominant attitudes.

Intelligence. The evidence with regard to intelligence is somewhat confused with the problem of verbal or language tests as well as the problems of comprehending the instructions for the intelligence tests. To a certain extent in the case of the hard-of-hearing, and to a greater degree in that of the totally deaf, the oral testing instructions must be kept at a minimum, and greater reliance must be placed upon pantomime. The test materials usually feature visual materials, such as formboards, which tend to capitalize on visualization and which is a specialized, rather than a generalized, type of intellectual function. It is also recognized that the deaf and the hard-of-hearing try to develop unusually keen powers of visual observation and hence are apt to make a creditable showing on such tests.

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[1] R. Madden, *The School Status of the Hard-of-Hearing Child*, Teachers College Contributions to Education, No. 499, Columbia University, New York, 1931, 64 pp.

[2] R. Pintner, "An Adjustment Test with Normal and Hard-of-Hearing Children," *Journal of Genetic Psychology*, 1940, **56**, pp. 367–381.

Many of the intelligence tests ordinarily used for hearing children contain materials requiring reading for comprehension and on this type of test, children with impaired hearing seem to be at a slight disadvantage. Waldman, Wade, and Aretz [1] used the National Intelligence Tests on several hundred hard-of-hearing children and found the poorer hearers averaging IQ's about 92 instead of the normal of 100. Pintner [2] obtained approximately similar results with his Verbal Intelligence Test, but with his Non-language Mental Test the differences disappeared. It is difficult for the person with normal hearing to realize the limitations and the barriers to normal communication, as well as the meager opportunities for comprehension, which characterize the world in which the hard-of-hearing and the totally deaf usually live.

In addition to the Pintner Non-language Intelligence Test many other similar types of tests have been devised. These include the Goodenough Draw-A-Man Test, the Pintner-Paterson Performance Scale, the Grace Arthur Scale and the Porteus Maze Test. The Ferguson Form Boards consist of a series of six boards with the cut-out blocks increasing in difficulty from the first to the last boards. This test has proved quite usable with the deaf and the hard-of-hearing.

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[1] J. L. Waldman, F. A. Wade, and C. W. Aretz, *Hearing and the School Child*, The Volta Bureau, Washington, D. C., 1930.

[2] R. Pintner, J. Eisenson, and M. Stanton, *The Psychology of the Physically Handicapped*, F. S. Crofts Co., New York, 1940, pp. 190–192.

Amoss[1] constructed the Ontario School-Ability Examination which is applicable for children with impaired hearing and has been used successfully in many of the schools for the deaf throughout the United States and Canada. The Nebraska Tests of Learning Aptitude is an individual psychological examination constructed and standardized on deaf children by Marshall Hiskey.[2] Kirk and Perry[3] reported on a comparative study of the Ontario and the Nebraska Tests of the deaf on 49 deaf children in attendance at a day school for the deaf, and 49 hearing children on whom both tests and the Revised Stanford-Binet test were administered. The Ontario Test rated both deaf and hearing children considerably higher than on the Nebraska Test, but for hearing children the Ontario Test was on closer agreement with the Binet Test than was true of the Nebraska Test.

At the Detroit Day School for the Deaf several types of intelligence tests are used. Both the Ontario and the Nebraska Tests have been put into limited use as well as adaptations of the Merrill-Palmer Performance Tests for younger children. The Detroit Tests of Learning Aptitude[4] have also proved useful for the examination of children with impaired hearing. This series of tests has been standardized on normal hearing children and used extensively for many years as the chief instrument of individual psychological diagnosis in the Psychological Clinic of the Detroit Public Schools. Ten of the nineteen subtests of this series may be given with comparatively little use of language in the test instruction and administration and with the material being mainly of a non-verbal nature. Among these subtests are pictorial opposites, pictorial absurdities, motor speed and precision, visual attention spans for pictures of objects and for letters, visual recall and execution of a series of visual designs arranged in order of increasing difficulty, and the assembly of disarranged pictures. Pantomime and in some instances written instructions are interpreted so that the pupils let it be known that they understand the directions for each part of the test. Mental ages are available for each subtest which can be assembled into a profile yielding a picture of strengths and weaknesses in the mental constitution as well as providing a median general mental age.

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[1] H. Amoss, *The Ontario School-Ability Examination*, The Ryerson Press, Toronto, Ontario.

[2] Test available from the author at Southern Illinois University, Carbondale, Illinois.

[3] S. A. Kirk, and J. Perry, "A Comparative Study of the Ontario and the Nebraska Tests of the Deaf," *American Annals of the Deaf*, 1948, **93**, pp. 315–323.

[4] H. J. Baker, and B. Leland, *The Detroit Tests of Learning Aptitude*, Public School Publishing Company, Bloomington, Illinois, 1939 (rev. ed.) 153 pp.

There has also been successful use of the various Detroit Group Intelligence Tests[1] given to small groups and with ample time to interpret and to understand the instructions for each part of the tests, after which the usual time limits are observed. Among such tests are the Detroit Primary Tests, Forms C and D; The Detroit Alpha Intelligence Test, Forms S and T; and the Detroit Tests of General Aptitude, Forms A and B, which include intelligence, mechanical and clerical aptitude. Many other standard group intelligence tests could undoubtedly be used in a similar manner. By this method some clinical observation is possible.

The Number of the Hard-of-Hearing

There are less accurate statistics on the number of the hard-of-hearing than for the partially seeing in which 0.002 per cent or one in five hundred was claimed. The number of severely handicapped hard-of-hearing needing the special type of class is probably almost as great as the partially seeing, since the number of the totally deaf is approximately equal to the blind. However, claims for impaired hearing of a degree equal to defective vision are 14 per cent as compared to 20 per cent for the vision group.

In some advanced data for the year 1939–1940 by the United States Office of Education the actual number of the deaf and the hard-of-hearing combined together in all types of special schools and classes was 14,673 as compared to 5870 for the blind and the partially seeing combined. This report shows that nearly three times as many hearing-defect cases as visually handicapped enjoy special education privileges. These numbers do not separate the deaf from the hard-of-hearing so it is impossible to determine the exact number of either. In any event, the educational provisions are hopelessly inadequate, according to the various estimates of the number of the hard-of-hearing. In a second bulletin from the same office it is estimated that there are 400,000 school children in need of special education because of impaired hearing. The W. P. A. project in New York City reports more than 11 per cent of the school population with impaired hearing.

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[1] Available through the Public School Publishing Company, Bloomington, Illinois.

If the same standard were set as in the case of the partially seeing every city with twenty thousand general population and a school population of four thousand should have at least one class for the hard-of-hearing. If teachers trained in lip-reading methods were available, many cities much smaller than twenty thousand, as well as towns and rural areas, could profitably conduct a partial or full-time program of lip-reading classes among regular classes as described in the preceding chapter.

The problem of numbers is as yet somewhat confused. Informal methods of estimating numbers are used in some communities whereas in others audiometer tests are used. However, in the latter case there is still considerable lack of agreement about general practical limits on the audiometer test. There is more general agreement in the case of the partially seeing, in which the 20/70 vision of the better eye after optimum correction is a fairly prevalent rough standard.

Causes

There are many causes of impaired hearing. They are centered mainly around stoppages of the vibrations or destruction of some portion of the mechanism. In the case of vision many of the defects were caused by distortions of the visual images, but this type of defect is largely absent in the case of hearing. However, stoppages and destructions from disease are much more frequent and this fact throws a heavy burden on the aurist or otologist. Since many of the causes of total deafness are also causes of impaired hearing, the reader is referred to the discussion of causes in the following chapter. A few of the main features are sketched here.

External symptoms. There are a few cases in which the pinna or outer portion of the ear is deformed so that the free passage of vibrations is blocked. In rare cases this outer portion is entirely lacking. Individuals vary as to the size and shape of the pinna. The author finds no investigation of the relationship of hearing to size and shape of the pinna. The style of hairdressing used by girls and women in which the ears are covered might impede hearing although more males than females have impaired hearing.

The chief difficulty from the outer ear is accumulation of wax which blocks the passage of air and sound waves to the tympanum. This wax may accumulate from the outer passage or it may be discharged from the middle ear when the tympanum has been ruptured. Earache and the insertion of cotton in the ear should be signs that some of these difficulties exist. Clearing the wax from the outer passage frequently is the only remedy needed for impaired hearing. This removal should be made very carefully and cautiously so as not to injure or puncture the eardrum or tympanum. Medical care is recommended.

The middle ear. In the preceding chapter, in which the structure of the ear was described, the importance of the balance of air pressure on both sides of the tympanum was emphasized. This balance is ordinarily maintained by the air passage or Eustachian tube leading from the middle ear, back of the tympanum, to the throat. The Eustachian tube is frequently blocked by infections of the throat and by diseases which travel along its passage into the middle ear. Otologists or aurists frequently recommend removal of tonsils and adenoids in cases of defective hearing before a final diagnosis of hearing impairment is made.

Whenever anyone suffers from a cold in the throat, tension in the ears is usually noted. If one swallows when the nose is held closed, the balance of air in the middle ear is disturbed. Whenever there is a sudden change in altitude such as in an elevator, driving rapidly up or down a long hill, and taking off and landing in an airplane, the noticeable pressure on the tympanum may be relieved by swallowing occasionally. Since these minor changes in air pressure are so apparent it is evident that such conditions as complete stoppage of air through the Eustachian tube may easily cause impairment of hearing.

The inner ear. There are various infectious diseases of a serious nature which not only affect the middle ear but also destroy the inner ear. These problems will be discussed more completely under the causes of deafness.

History of the Hard-of-Hearing

The use of lip-reading methods was first attempted with deaf adults and was attended by considerable success in various places as will be noted in the next chapter. Later, it was tried on deaf children, next on hard-of-hearing adults, and finally on hard-of-hearing children. Walle of Germany developed a method of lip reading for hard-of-hearing adults which was copied by Martha Bruhn in America about 1900. Edward Nitchie of Brooklyn opened a studio in New York City in 1903 for hard-of-hearing children but later spent his entire time on methods of teaching lip reading. He was forerunner of the New York League for the Hard-of-Hearing, established in 1910. Interest in these methods and other modifications such as the Whildin-Scally Method, the Mason Method, and the Jena Method created more demand for classes in lip reading. In 1920 the first classes of lip reading were opened in Lynn, Massachusetts, and in Rochester, New York, for children in regular grades.

Classes for the hard-of-hearing of the milder types made use of lip-reading methods with the children remaining enrolled in the regular grades. In addition to these activities, but generally preceding them in time, were classes for the hard-of-hearing in connection with schools for the deaf. In the early days of schools for the deaf these rather extreme cases were probably enrolled as being practically deaf. Eventually a study of their characteristics disclosed that some had practical use of their limited hearing and could with effort understand spoken language. The Detroit Day School for the Deaf was formally organized in 1900 with two classes starting in 1898. By about 1912 the administration of this school was aware of quite a number of cases which would now be classified more correctly as hard-of-hearing, and this date is the approximate beginning of Detroit's hard-of-hearing classes. Many other schools for the deaf also had similar experiences but offer less definite dates of special recognition. In 1939–1940 there were seventy-nine schools for the deaf and the hard-of-hearing sending survey reports to the United States Office of Education, although the total number of such schools and classes is much greater. At the White House Conference in 1930 there were reported 64 public residential, and 114 public day schools for the deaf.

When one considers the long-time existence of the hard-of-hearing and also the extension of universal education it seems unbelievable that these special classes and schools should have been established so recently as since 1900. In consideration of the recent development of such facilities it may be thought that rather encouraging progress has been made. On the other hand the number of children still lacking such provision should be a cause for concern.

Current Problems

Within the past few years there has been a tremendous advance in methods of teaching the hard-of-hearing with the use of electrical amplifying equipment of various kinds. In the Detroit Day School for the Deaf there are several sets of hearing aids by which the teacher is able to amplify sounds to the needs of each individual pupil in her group. In that manner the residual hearing is used to supplement the eye in learning how to lip read. There may be a strengthening effect from learning by combining the use of the eye and the ear which seems to amount to more than the sum of both taken separately. This effect may arise (if it exists) from the rich, associative processes of the brain when stimulated from two or more different sources at the same time.

There is a certain but undetermined percentage of hard-of-hearing pupils whose loss of hearing becomes increasingly greater even in the face of the best medical care and education. This deterioriation is parallel to some of the vision loss in cases of impaired vision, and it constitutes a constant challenge to all parties interested in the education and welfare of the hard-of-hearing.

The conditions of lighting must be unusually good for the hard-of-hearing so that they may see the lips of the teacher and of others whose lips are to be read. There must be a constant awareness of the psychological effects of possible social isolation unless great efforts are expended by the pupils to keep the normal channels of communication open to the general population. All of these projects and many others are well worth the labor and cost if thousands of the hard-of-hearing may achieve the goal of successful and happy citizens.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Discuss orally or in writing any firsthand experiences which you may have had with any hard-of-hearing persons, and interpret them in the light of problems discussed in this chapter.
2. Discuss why any arbitrary limits of the hard-of-hearing in terms of the amount of effective hearing is not a practical means of classification.
3. Describe your impressions of the personality characteristics of the hard-of-hearing as a group.
4. If possible, visit the office of an aurist or otologist and ask him to explain his equipment and demonstrate his handling of an examination. Visit the clinic in a School for the Deaf.
5. Visit a hard-of-hearing class and observe the program in practical operation.
6. Make contacts with local luncheon clubs to learn firsthand what they are doing for the hard-of-hearing and report to the class.
7. Prepare a list and brief description of pamphlets and bulletins on hearing conditions such as are issued by the American Society for the Hard-of-Hearing, The American Association to Promote the Teaching of Speech to the Deaf, the United States Office of Education.

Chapter VIII

THE DEAF

The most extreme types of hearing defects are the deaf. There is no absolute line of demarcation between the hard-of-hearing and the deaf in terms of amount of hearing by any method of testing. Each case is decided upon its individual merits by the examining physician. Some of the main points of differentiation are given under the definitions in the following section. Total deafness is not so obvious as total blindness in which the groping of the individual is immediately apparent. The average citizen believes that blindness is a greater handicap than deafness although the latter is actually a greater handicap, because the deaf person is denied most normal social contacts. The person born deaf is much more handicapped than the person born blind. However, each field has its own unique problems and nothing is gained for either by making comparisons and contrasts.

Definitions of Deafness

As in the case of vision handicaps, there are three types of cases: regular-grade children with slight hearing loss, the hard-of-hearing type, and the totally deaf. The first two of these have been discussed in preceding chapters.

In 1937 a committee of the Conference of Executives of American Schools for the Deaf[1] set up definitions as follows:

genital

entitious

> *The deaf.* Those in whom the sense of hearing is non-functional for the ordinary purposes of life. This general group is made up of two distinct classes, based entirely on the time of the loss of hearing: (a) *the congenitally deaf*—those who were born deaf; (b) *the adventitiously deaf*—those who were born with normal hearing but in

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[1] R. Pintner, J. Eisenson, and M. Stanton, *The Psychology of the Physically Handicapped*, p. 101.

> whom the sense of hearing has become non-functional through illness or accident.

Pintner [1] says:

> There is, of course, no sharp dividing line between these two groups of individuals. One cannot divide them into two groups by means of audiometer tests, because some of the deaf may have more sound perception than some of the hearing. Nevertheless, the difference between the two groups is psychologically clear and distinct. The deaf are those who have never learned language incidentally in the ordinary way—in the way the normal child picks it up from his environment, casually, unconsciously. The hard-of-hearing are those who, in spite of their hearing handicap, did learn language in just this unconscious casual manner like the normal hearing child. This basic difference between the two groups means that they require quite different methods of education.

In the 1920 United States Census, enumerators had instructions as follows: “The census of deaf-mutes covers all persons who by reason of defective hearing either have never acquired the faculty of articulate speech, or have required special instruction in order to acquire it.” The 1930 instructions were quite similar. The census instructions divided the deaf into three classes: (1) totally deaf persons, unable to use speech as a means of communication; (2) totally deaf persons who lost their hearing before the age of eight, including those who use speech as a means of communication; (3) partially deaf persons whose deafness occurred before the age of eight and who can hear with a hearing aid.

It is evident from these definitions that loss of speech, or inability to speak with its loss by the usual means of communication, is an important phase of deafness.

Characteristics of the Deaf

As in the case of other defects, the deaf have many ways in which they are different from the hearing or nonhandicapped, but also many ways in which they are similar. In order to gain a better understanding of the deaf, as a group, there are certain qualities in which they differ from the hearing. This knowledge is useful in their education.

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[1] Pintner, Eisenson, and Stanton, *ibid.*, pp. 101–102.

As a group the deaf are inattentive, imperfect in speech, bewildered and baffled in expression, sensitive, and aloof because of deafness. They frequently complain of earache, have discharging ears, are mouth breathers, and hold their heads in peculiar postures so as to hear all they can from meager sounds which fall upon their ears. Theirs is a world of isolation. Although the channels of communication may be kept open by great effort, it is always easy to let them become closed. They become blocked through lack of constant use, like the faint trail in a blinding snowstorm on a country road.

Personality. There are great differences of opinion about the personality characteristics of the deaf. Brunschwig[1] presents these ideas at length and centers them around a few topics as follows: (1) Various writers have claimed that the uneducated deaf are supposed to be melancholy, suspicious, treacherous, cruel, narrow, unsympathetic, morbid, selfish, jealous, unreliable, vindictive and the like but that education would remove such qualities; (2) opinions range from one extreme to the other about any basic differences between the deaf and hearing as to psychological types; (3) environmental factors show extremes of ideas from happy and cheerful influences to spoiling and repression with many claims of mental and emotional maladjustments; (4) personal adjustments run the same gauntlet from cruel to kind, from sadness to cheerfulness; and (5) with social inferiority and clannishness which is denied by those who note how freely they associate with the hearing in their homes and business experiences. This same author measured some deaf and some hearing children on her Adjustment Inventory in which the language had been simplified to the comprehension of the deaf. The results show only minor advantages in favor of the hearing.

Several other investigators using various personality tests found their deaf groups more neurotic, had greater insecurity, were more introvert, and less dominant than the hearing. Pintner believes that the results are grossly exaggerated because the tests are not adapted to the deaf who have less language ability and probably do not understand the meanings of the various items.

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[1] L. Brunschwig, *A Study of Some Personality Aspects of Deaf Children*, Teachers College Contributions to Education, No. 687, Columbia University, New York, 1936, 143 pp.

Physical characteristics. Frampton and Rowell[1] summarize several reports which show that about twice as many deaf as hearing children have defects of vision, ranging up to 40 per cent in some instances. The causes are not fully known, but it might be thought that with impaired hearing a greater strain is put upon the eyes as a means of compensation. Vision handicap adds to the handicap of deafness in cases where lip reading is used as well as in general use of the eyes. Kucharski[2] concluded from his investigations that auditory sensations do not persist in memory nearly so long as do visual ones and that muffled or inadequate auditory sensations fade so quickly that defective hearing is more handicapped by fleeting impressions than is defective vision. McAuliffe[3] states that the ear, particularly among the aged, tends to degenerate in more ways and in more of its portions than is true of any of the other sense organs.

Speech characteristics. Speech is closely related to hearing, in fact most people incorrectly believe that the deaf are incapable of speech. The deaf were formerly called the "deaf and dumb" with the dumbness referring to lack of speech, rather than to mentality. With modern educational methods for the deaf many who have been totally deaf from birth learn to speak in entirely normal tones. According to Hudgins[4] speech of the deaf tends to be slow in rate, and to have prolonged vowels, abnormal rhythm, nasality, and poor consonants with extra vowels. Voelker[5] reports that the speech of the deaf may be as much as four times as long or slow as that of the hearing. In the discussions in the chapter on speech this relationship to hearing defect will be continued.

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[1] M. E. Frampton and H. G. Rowell, *Education of the Handicapped, Vol. II, Problems*, p. 204.

[2] P. Kucharski, "On the Persistence of Auditory Sensations," *Comptes Rendus Sociologique Biologique*, 1927, **97**, pp. 691–693.

[3] G. B. McAuliffe, "The Senile Ear," *Medical Journal and Record*, 1928, **7**, pp. 358–359.

[4] C. V. Hudgins, "A Comparative Study of the Speech Coordination of Deaf and Normal Subjects," *Journal of Genetic Psychology*, 1934, **44**, pp. 3–48.

[5] C. H. Voelker, "A Preliminary Strobophotoscopic Study of the Speech of the Deaf," *American Annals of the Deaf*, 1935, **80**, pp. 243–259.

Intelligence. Many studies have been made on the intelligence of the deaf. Pintner[1] gives the most complete summaries of such studies. He notes that the median I.Q. from six different surveys with performance tests is 91, which is only nine points below the general average for all individuals. Pintner notes that the usual language concepts in verbal tests of intelligence are decidedly outside of the comprehension of the deaf and hence do not fairly reflect true mental status. Springer[2] found a mean I.Q. of 96 with the Goodenough Drawing-A-Man Scale in measuring 330 deaf children, which is slightly better than Pintner summaries. However, this test does not give as all-round a picture of mental ability as do the various performance tests according to Pintner. Bridgman[3] investigated for factors which differentiated between behavior and nonbehavior cases of deaf children and concluded that I.Q. differences were not significant. Myklebust and Burchard[4] gave the Arthur Performance Scale to 121 congenitally and 68 adventitiously deaf children of school age at a state institution for the deaf. They found no statistically reliable difference between the two groups, but with the boys excelling the girls, a fact which has also been noted in other studies of the deaf.

Special abilities. The mental images of a hearing child at the age of four years do not appear until the age of six years in the deaf, according to Rabinovitch.[5] He also comments that visual memory is not so well developed in deaf-mutes as in the hearing, nor do they seem to fix the images by the same processes. Vertes[1] demonstrated that deaf children are deficient in memory for words which appeal to the auditory sense, but are much better in words appealing to the kinesthetic sense. It was discovered that the deaf were not much different from the hearing in motor tests. Morsh[2] found them equal to the hearing in tapping and in hand-eye coordination, inferior in speed of eye movements, but superior in steadiness, in balancing, and in locations. Hofler proved that the deaf were poorer as witnesses with inadequate testimony, with wrong interpretation of lip movements and faulty understanding of gestures.

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[1] R. Pintner, J. Eisenson, and M. Stanton, *The Psychology of the Physically Handicapped*, p. 117.

[2] N. N. Springer, "A Comparative Study of the Intelligence of a Group of Deaf and Hearing Children," *American Annals of the Deaf*, 1938, **83**, pp. 138–152.

[3] O. Bridgman, "The Estimation of Mental Ability in Deaf Children," *American Annals of the Deaf*, 1939, **84**, pp. 337–349.

[4] H. R. Myklebust, and E. M. L. Burchard, "A Study of the Effects of Congenital and Adventitious Deafness on the Intelligence, Personality, and Social Maturity of School Children," *Journal of Educational Psychology*, 1945, **36**, pp. 321–344.

[5] M. Rabinovitch, "The Psychology of Deaf Mutes." *Prophylactique Mental*, 1927, **3**, pp. 339–344.

It is evident from these studies that much research of a thorough nature should be conducted on various phases of the deaf, particularly on studies of personality so that a more effective program of education may be planned.

The Number of Deaf

As in the case of the blind, the United States Census since 1830 has enumerated the deaf from decade to decade. In 1830 there were approximately 6000 deaf, in 1930 the number reported was 57,123. This total number represents 465 in every one million of the population or one person in every 2150 of the population. From the variations in the number on the decennial census it is practically impossible to state whether deafness is on the increase or decrease. Since there is less concerted drive upon particular causes, as in the case of blindness, it is difficult to predict the trends toward a decrease. However, one never knows in these days of scientific discovery what changes and improvements may take place at any time.

In the 1930 Census[3] the report of the number of the deaf by age and sex is shown in Table V.

From Table V it will be noted that there are 15,886 deaf children from the ages of five to nineteen years inclusive or approximately of school age. The ratio of boys to girls is about eight to seven, which is more nearly equal between the sexes than for the blind. As the older ages are reached the numbers of men and women are more nearly equal, and for the oldest group the women exceed men in those who reported on the census. The census data show only about four thousand Negroes reported, four hundred Mexicans, and about three hundred Indians.

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[1] J. O. Vertes, "The Memory of Deaf Mute Children," *Zeitschrift für Padagogische Psychologie*, 1931, **3**, pp. 136–142.

[2] J. E. Morsh, "A Comparative Study of Deaf and Hearing Students," *American Annals of the Deaf*, 1937, **82**, pp. 223–233.

[3] U. S. Census.

TABLE V

AGE AND SEX OF DEAF, 1930 CENSUS

Age	*Total*	*Male*	*Female*
Under 5	919	501	418
5–9	3,950	2,082	1,868
10–14	6,262	3,324	2,938
15–19	5,674	3,053	2,621
20–24	4,708	2,470	2,238
25–44	16,801	8,626	8,175
45–64	12,343	6,144	6,199
65 and up	6,388	3,027	3,361
Unknown	78	40	38
Totals	57,123	29,267	27,856

There are probably the same limitations about the accuracy of numbers for the deaf as for the blind, except that less accurate checks from other sources are available than for the blind. If the same ratios held true for the deaf, not more than about one-half of the total number were discovered by the census. Reluctance of families to report members who are deaf, limitations on thoroughness by enumerators, and similar causes probably operate. One of the main purposes of the census was an approximation in order to furnish an incentive for organizations to make more detailed studies and set up suitable programs of education and training. In 1938 Berry[1] estimated the total number of the deaf in the United States at 121,878, which is over twice as many as reported on the census. In the case of the blind, other surveys also claimed about double the number from the census.

In 1939 Fusfeld[2] reported 19,161 deaf children attending various types of schools. This number is over 3000 more than reported by the census as of school age. Of this number 13,672 were in 66 public residential schools, 4,602 in 128 public day schools, and 887 in 19 denominational and private schools. It is very unlikely that all of the deaf children in the country are being taught in these different types of schools.

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[1] G. Berry, "Deafness in the United States," *The Volta Review*, 1938, **40**, p. 69.

[2] I. S. Fusfeld, "Tabular Statement of American Schools for the Deaf," *American Annals of the Deaf*, 1940, **85**, pp. 8–35.

Methods of Diagnosis

There are various methods of examination for the determination of hearing defect or disease. In Chap. VI several symptoms of hearing defect were listed and the methods of using the group audiometers were presented. Although this method has some acknowledged limitations it serves a useful and economical purpose in making a rough screening of the more severe cases.

The use of some audiometers for careful individual examination was presented in Chap. VII as a means of diagnosing the hard-of-hearing or those with more severe hearing loss. It was stated that a loss of from 35 to 50 per cent in hearing admitted pupils to the Detroit Day School for the Deaf. This includes both the deaf and the hard-of-hearing. The dividing line between these two groups is not a definite one in terms of hearing loss on the audiometer, although they tend to be up toward a 100 per cent or complete loss. A No. 6 audiometer often shows some slight hearing at certain pitch levels either in air-conduction or bone-conduction tests in those who are believed to be totally deaf.

It should be mentioned again that the chief distinction between the hard-of-hearing and the deaf lies in whether or not the individual has made use of his reduced hearing in learning to speak or as a means of communication. Persons with considerable hearing who have never made use of it are technically deaf, whereas those with serious loss who have capitalized their limited hearing to good advantage in learning to speak are considered to be hard of hearing.

There are many causes of deafness arising from various diseases which impair the efficiency of the ear. The diagnosis of deafness or of hard-of-hearing may rest upon the progressive effects of these diseases rather than upon the amount of hearing loss as measured on the audiometer. This fact is similar to the diagnostic procedures for defective vision in which diseases of the eye are taken into account as well as the amount of vision loss. At these more extreme levels the diagnosis should always rest with the medical specialist. The nomination of cases by teachers using informal methods should always be encouraged to serve as a source of possible cases for the ear specialist.

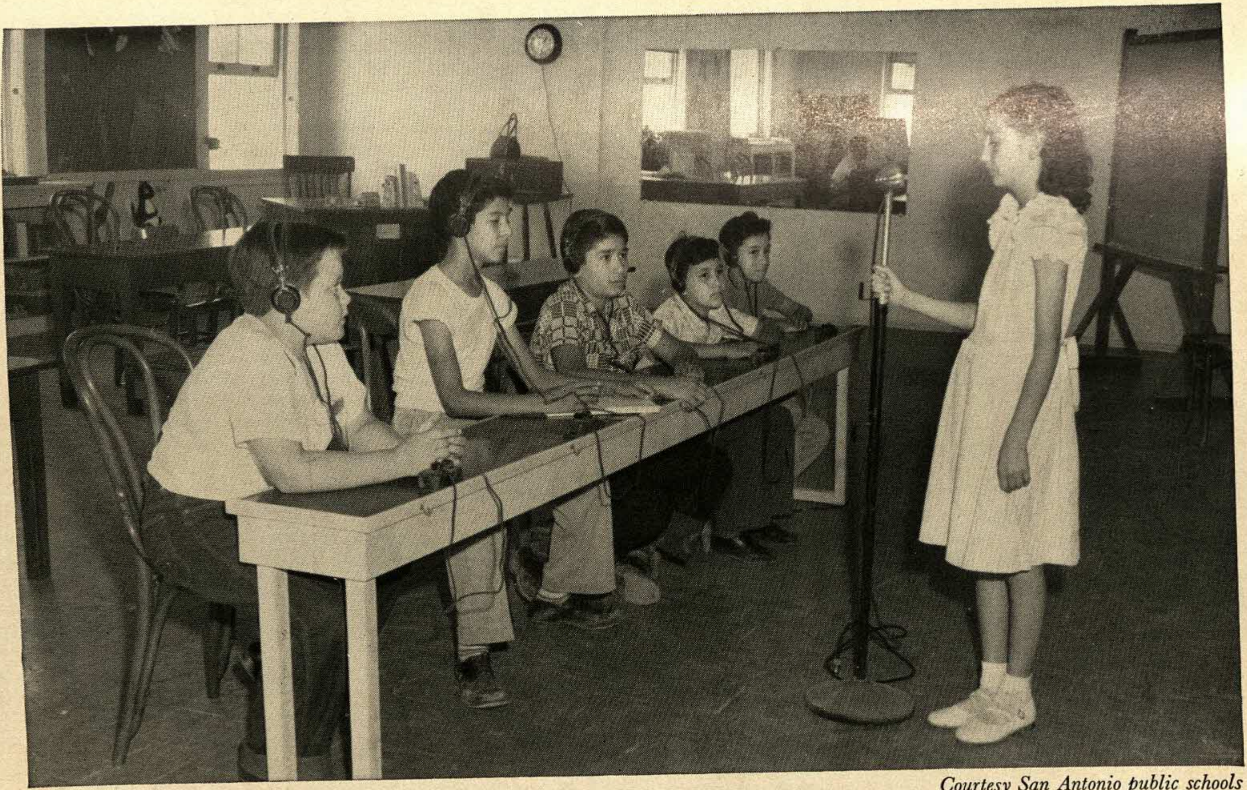
Causes and Preventions

iological
pographical

As in the case of blindness it would seem logical to divide causes of deafness into the two general classes of etiological and area or topographical. To date such a classification has not been noted by writers on the deaf. The etiological causes are chiefly disease, accident, or hereditary trends, while the topographical causes affect some specific part of the ear, such as stoppage of the passages or actual destruction of some portion of the hearing mechanism. The topographical causes are of chief concern to the aurist while the etiological causes are of specific interest to teachers, parents, and the general public.

Among the etiological causes are measles, meningitis, scarlet fever, and other contagious diseases which lead to topographical causes by destruction of portions of the ear. When any individual is afflicted with these diseases he should be guarded against colds, pneumonia, and other complications which may affect the throat and the Eustachian tube leading to the middle ear. Fevers bring actual destructions of various vital portions of the ear itself. Colds, sore throats, and enlarged and diseased tonsils add to the list of etiological causes. It is further supplemented by boxing the ears, by accidents, and by loud noises and explosions. The 1920 Census showed that 38.6 per cent of deafness is of a congenital nature, either hereditary or prenatal. Of acquired deafness 41.5 per cent is caused by scarlet fever and meningitis. Measles cause 5.7 per cent of the acquired cases, with lesser amounts for typhoid fever, whooping cough, abscesses, and others.

Deafness among relatives of the deaf is a very frequent oc-



Courtesy San Antonio public schools

Amplifying equipment used for the instruction of hard-of-hearing pupils in the Eloise Japhet School for Exceptional Children in San Antonio, Texas.

Courtesy Minneapolis public schools

Groups of stimulus words are given in auditory stimulation in an attempt to set up in the brain patterns for particular speech sounds, Minneapolis public schools.

currence amounting to about one-third of all cases of the congenitally deaf. In cases of congenital deafness the parents were cousins, with 146 cases of first cousins, 90 cases of second cousins, 37 of third cousins, and 20 of fourth cousins. These facts show clearly the dangers of intermarriage. It may be inferred that the closer the relationship, the more likely the tendency that deafness be passed on from some common ancestor, such as a grandparent. In the case of fourth cousins the common ancestor is a grand-grand-grand-grandparent. With more intervening generations, the likelihood of transmitting deafness is probably much less.

For sociological and psychological reasons the deaf are likely to intermarry because they have common interests in their defects and common problems of understanding each other. Since deafness seems to be a hereditary tendency, it is natural that children of the deaf should be congenitally deaf.

Another common cause of deafness is wax in the ears. Wax is formed and fills most of the outer ear so that the sound waves cannot travel to the interior. This condition is more likely to produce reduced hearing than complete deafness, but it is important enough so that the ear specialist usually asks for removal of the wax before he makes a final diagnosis of hearing defect. Excessive wax which protrudes plainly from the ear also gives a general impression of untidiness. It should be removed by gentle means, since the use of a sharp instrument may injure the tympanum, or eardrum. Diseased tonsils and adenoids frequently spread infection to the middle ear and destroy the function of that area. These causes may be termed primarily "etiological."

It is rather difficult to differentiate completely the etiological causes from the area or topographical ones. All cases of deafness probably have some etiological cause as well as topographical. In general, anything which produces a stoppage of the sound wave from reaching the proper terminal is a topographical cause. In the outer ear this may be a stoppage of the outer canal. Deformity of the pinna may close the canal.

Separating the outer canal from the middle ear is the tympanum, on the interior of which is attached the three bones commonly known as hammer, anvil, and stirrup. These bones transmit the sound waves from the tympanum to the inner ear. When the tympanum is destroyed hearing still takes place, but it becomes somewhat muffled. Ordinarily the tympanum has a balance of air pressure on each side so that it may vibrate freely, and this is achieved by passage of air to the middle ear through the Eustachian tube from the throat. When the Eustachian tube is infected, or when infections develop in the middle ear, the sound waves are blocked from reaching the auditory nerve in the inner ear. Many cases of possible deafness are prevented when the tympanum is discovered to be distended. It is then punctured by a physician and the infections of the middle ear are allowed to drain away. The tympanum may soon heal, and in cases where it does not heal completely, the hearing is not destroyed, only slightly impaired. However, there is more danger of infection from the outer canal when the tympanum does not completely heal.

The inner ear is a very delicate mechanism with a semicircular canal containing liquid. Extending into it are hair-like projections that house the terminals of the auditory nerve. The various diseases, noted above, destroy this supporting liquid and the nerve ends as well. The entire bony structure in which the canal is encased may also be destroyed. Obviously when such mutilations occur, there is loss of hearing, often total deafness. These area or topographical causes are of primary interest to the ear specialist, although their results and their etiological causes are also of interest to parents and teachers.

An interesting sidelight on the inner ear is found in the fact that the semicircular canals perform some functions in regard to balance. Airplane pilots must accustom themselves to flying in many unusual positions, even upside down. With sudden changes in position many individuals are unable to pass the qualifying tests.

History of the Deaf

The history of the deaf will be discussed under the following topics: (1) their treatment in society; (2) schools and founders of schools for the deaf; and (3) methods of teaching the deaf.

Treatment in society. In the chapter on the blind it was noted that throughout the early history of civilization there was much sympathy for the blind on account of the obvious and visible nature of their handicap. Since the handicap of deafness is not so obvious upon casual meeting the deaf did not receive the same consideration. They were able to get about and seemed to act in many ways like the average nonhandicapped citizen. As a matter of fact they were very greatly handicapped.

Their handicap was actually a triple one. ① The first part of it was the deafness itself, which deprived them of the usual means of communication. At first thought this difficulty might not seem serious. There was the obvious solution of having communications written for them to read. There was very little writing, even for the nonhandicapped, no sign language which others could use, and those who were congenitally deaf, or deaf from early childhood, did not have the usual background of some education similar to that of the average citizen of today.

The second phase of the hearing handicap was that one of the most important channels of communication to the brain was shut off. With the loss of hearing the brain did not function to its full capacity. It tended to lie in an unused or dormant state, although it was perfectly capable of functioning normally. However, for practical purposes the deaf were often judged to be extremely feeble-minded and hence incapable of understanding or of rational living. Although the problems of feeble-mindedness are to be discussed in a later chapter, it is timely to remark that harsh judgments of the feeble-minded in terms of their limited responsibility for their condition is one of the gross errors in human misunderstanding. To put it in more practical terms, it is often believed that if the feeble-minded will just stretch themselves mentally, they can assume normal mental height, and anything less than this is mere laziness and negligence. Nothing is more futile, unless it would be to expect taller physical height by some wishful stretching. In these complications and errors of diagnosis the deaf generally found themselves mistaken for the feeble-minded to the detriment of both groups. Even today there is considerable difficulty when placement agencies and courts sometimes assign feeble-minded individuals to deaf schools without knowing the real nature of the defect.

The third complication arose from the fact that the deaf generally did not speak, and hence were judged to be incapable of speech. The great Greek philosopher, Aristotle, came to this conclusion and believed that the deaf were ineducable. His opinion became that of the church, and it was believed so implicitly because of its seeming authority that little was done for the next two thousand years to discover the real facts. Actually the deaf tended to be speechless, not because they did not have the organs of speech, but because their very deafness deprived them of the opportunity of training in speech. It is not realized generally even today that speech is usually developed by hearing others speak and copying their speech sounds through trial and error. More will be said about this relationship later.

It is sufficient to say that the deaf were extremely handicapped, because they could not hear, because their potential intelligence was largely blocked from deafness, and because, lacking models in the speech of others, their speech did not develop. It is little wonder that understanding and training the deaf made scant progress up to two hundred years ago. Only in very recent years have substantial results been achieved.

Schools and founders of schools for the deaf. History does not disclose so many famous deaf characters as it does for the blind, which may give support to the theory that deafness is a greater psychological and sociological handicap than blindness. Beethoven became deaf and the great Edison was very hard of hearing. In the latter case his teachers did not recognize the true nature of his defect and interpreted his inattention to indifference or to lack of ability. There were many relatives of royalty and nobility who were deaf, and upon whose instruction many teachers toiled wearily. In the main such teachers were supported by private incomes bestowed upon them by wealthy relatives. Thus they had unlimited time to try many methods and devices for teaching their deaf pupils.

In Rome the deaf Q. Pedius of the family of the orator, Messala, became very proficient in the art of painting.[1] The Spanish Titian, Juan Fernandez Navarette, won fame by painting portraits of many members of the court of King Philip II. St. John of Beverly was reported by his pupil, the Venerable Bede, in 685 A.D. to have made a dumb boy speak and read lips. Rudolph Agricola of Holland was the first to record that a deaf-mute had learned to write.

In the sixteenth and seventeenth centuries three famous Spaniards, Pedro Ponce de Leon, Bonet, and Ramires de Carrion, achieved fame in successfully educating many of their countrymen of noble birth who were deaf. This suggests a hereditary strain of deafness within the group. Many of their pupils were so successful that they were admitted to Mass and eventually the long held theories of Aristotle that the deaf could not be taught were broken from the tradition of the church.

In the period of brilliant French history in the eighteenth century, two great teachers of the deaf are to be found, Abbé de l'Épée and his pupil, Abbé Sicard. The former taught by a combination of oral and manual methods although he believed that the oral method would eventually be the most practical. Sicard laid more emphasis upon the manual method and used writing as a basis of teaching. Contemporary with these men was the German, Samuel Heinicke, who established a school for the deaf in Leipzig in 1778. He was a strong advocate of the oral method of teaching. The oral method was monopolized in England by the Braidwood family and hence did not have much general usefulness during their time.

Thomas Hopkins Gallaudet (1785–1851) was the American pioneer in teaching the deaf. Today the Gallaudet College for the Deaf in Washington, D. C., is a lasting memorial to his pioneer efforts. His early health was poor so that he could not complete his course in law. Some years later he graduated from the Andover Theological Seminary although he was not in good enough health to preach regularly. He became interested in trying to teach the small deaf daughter of Dr. Mason Cogswell according to the methods of Sicard. From private contributions he was sent to Europe to study methods of teaching the deaf. At first he was discouraged by the extreme reticence of the Braidwoods in England, but Sicard gave him a hearty invitation to France when he chanced to meet him while Sicard was lecturing in London. After a few months he returned to America and brought with him Laurent Clerc as a teacher for the deaf. The first school for the deaf was opened by Gallaudet at Hartford, Connecticut, April 15, 1817.

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[1] A rather extensive history of the deaf is to be found in M. E. Frampton and H. G. Rowell, *Education of the Handicapped, Vol. I, History*, pp. 45–86.

In 1819 Massachusetts voted to send its deaf pupils to Hartford. Its action was followed similarly by several other states as far away as Georgia. Gallaudet and Clerc were unusually successful salesmen in the extension of schools and financial support for the deaf. In 1818 Clerc persuaded Congress to allot 23,000 acres of wild land which were later sold for $300,000. These two men also began traveling from state to state in getting legislatures to establish schools for the deaf. They always had well-planned drives supported by the press and by many influential groups, so that the authorization was usually passed in a great emotional scene after a demonstration by deaf pupils from other state schools. Today there are over two hundred schools of various kinds with approximately twenty thousand deaf pupils and three thousand teachers.

In discussing the history of the deaf the work of Dr. Alexander Graham Bell, inventor of the telephone, should be emphasized. Dr. Bell combined various motivations in his phenomenal success in teaching speech to the deaf. These factors included: knowledge of phonetics from a book entitled *Visible Speech* written by Bell's father; success of using this knowledge in teaching the deaf Mabel Hubbard to speak, a lady he later married; returns from his telephone inventions which enabled him to build the Volta Bureau Building in Washington. This building became the headquarters for the American Association to Promote the Teaching of Speech to the Deaf. Although his early efforts to interest schools for the deaf in the possibilities of speech were largely ignored as impossible and not worth the tremendous effort, he eventually became a real leader in the field.

There were two methods of teaching: the manual method, chiefly used by Sicard and introduced into America by Gallaudet, who studied under Sicard; and the oral method used by Heinicke in Germany and by the Braidwoods in England. For the first thirty years after Gallaudet established the manual method in the original Hartford school it had such a strong tradition behind it that little progress in the oral method was made. The great American educator, Horace Mann, visited Europe in 1843 and was impressed with the possibilities of the oral method, but it was not until twenty-four years later, in 1867, that the first oral school in America was established as the Clarke Institute at Northampton, Massachusetts. On account of the influence of Gallaudet and Clerc for the manual method it was adopted in most of the state residential schools. In more recent years the city day schools began to use oral methods and the rapid growth of these schools is cited by the advocates of the oral method as evidence of its greater usefulness.

It is most unfortunate that such sharp differences in opinion about methods of teaching the deaf developed from historical beginnings. The struggle is somewhat similar to the long-standing controversy about the merits of various point methods of teaching the blind. The chief advantage which might be gained from such differences should arise from bringing the best features of various methods together. Some attempts have actually been made by a combination of the manual and oral methods. However, the general effect has often resulted in confusion in the mind of the public and refusal to support any method. Lack of confidence upon the part of pupils and their parents might also result. For some unexplainable reason when any handicapped group is very small in number but seriously handicapped the more violent have been the disputes over different methods of treatment and education. To some degree this phenomenon of disagreement arises also between those sponsoring different types of the handicapped, such as the blind and the deaf.

Present Methods and Trends

As noted above, there are two general methods of teaching the deaf; the manual, and the oral. Practically, these two methods may be subdivided into four: the manual, the manual-alphabet, the oral, and the combined. The manual method makes use of the manual-alphabet and a large number of bodily signs, gestures, and facial expressions which depict many different moods. The manual-alphabet is more restricted to the signs for the letters of the alphabet. Its proponents believe that there is less likely to be corruption in the use of language when it is separate from the manual method. The oral method uses lip reading to understand the speech of others, and its success depends largely upon the ability of the deaf to learn actual speech so that conversation may take place in the usual ways. The chief difficulty arises in getting a start on meanings of words among the congenitally deaf. Many deaf schools wish to begin when deaf children are not more than three years of age; if they delay until the age of six, the child usually succumbs to the idea that it is of no use to try and he will get along with any crude method of signs, mostly of his own making. The combined method uses the oral method as far as possible but supplements it with some signs, chiefly in play activities, whereas the oral method prevails in the classroom.

The manual methods are often believed to be easier and more specific to learn and more capable of being understood by those deaf who are below average in intelligence. Since only a few intimate acquaintances and the immediate family take enough interest to learn the manual methods, the deaf who depend upon them exclusively find their social contacts very much restricted. In the oral methods the pupil learns to read the lips and hence is able to understand the speech of any hearing individuals with ordinary speech. Whenever the deaf also master speech, and have average or superior intelligence, they are able to fit into the usual social patterns of the hearing.

Lip reading is difficult to learn. Every letter of the alphabet is not pronounced separately, but phonetic units occur which are similar to the phonetic methods of reading and spelling for hearing pupils. Unless these units are introduced slowly, a few at a time, the deaf pupil becomes confused. Skill in lip reading eventually corresponds to rapid, silent reading in which whole words or phrases are comprehended at a glance in contrast to slow and laborious methods of spelling out each letter of each word separately. There is a further difficulty in that hearing individuals vary greatly in the amount of lip movements which they use in speaking. This is parallel to the difficulty in quickly adjusting to the handwriting of different individuals. Furthermore, certain letters look alike to the lip reader such as *b*, *p*, and *m;* *t*, *d*, and *n;* he must decide from the context which letter is being pronounced. In beginning to teach lip reading, the teacher pronounces a word such as *ball* and at the same time plays with a ball so that the children learn to associate the lips with the object. Within a short time other objects are added in the same way, and the pupils soon learn to study the lips without the objects themselves being present and hence learn independently of the objects. Verbs of action are mastered in the same way and gradually a concept of language in its larger aspects is developed.

In learning to understand speech and to develop their own speech various other methods are also being used to supplement the lip reading. The child is encouraged to use the sense of touch as well as sight and to feel the throat of the teacher so as to discover what parts of the speech organs move and how they operate. Miss Alcorn of the Detroit School experimented successfully with this method of learning with two children named Tad and Oma and thus the Tadoma method was developed. Further experimentation is under way in various places to explore the possibilities of tactual methods.

The use of electrical equipment, particularly with amplifying devices, has greatly expanded the possibilities for teaching the deaf in the past few years. Through the diagnostic use of newer types of audiometers any traces of residual hearing in either ear at any pitch and for any intensity become known.

Tones at those critical points are then practised with the pupil by the use of the radio ear, a device which may be used by from ten to fifteen pupils or more at a time. Each pupil is fitted with earphones and each one may be adjusted to the suitable volume so that the sound sensations are clarified. Through the use of this residual hearing it is possible to resort to lip reading much more effectively than if no hearing is present. With increased knowledge of electrical amplifying apparatus and also better knowledge of the mechanisms of speech it is likely that education of the deaf will rapidly advance to new and unhoped for levels.

Current Trends in Educating the Deaf

The education of the deaf is a highly specialized and intensive type of education, as already shown from the history and the psychology of the deaf. The teachers must be especially well trained, not only with the contents of the regular curriculum, but also in ways and means of opening up avenues of communication so that pupils may find such subjects accessible.

The size of the deaf class must be kept very small so that individual attention is possible for every pupil and the best possible types of human relationship may exist between pupil and teacher. The present trend is from eight to ten pupils per class and, hence, the cost is several times that of hearing pupils. When it is considered what education really accomplishes for deaf children in training them to speak and otherwise live normal lives socially, as well as psychologically, the greater cost is well repaid.

In the past few years and as an aftermath of war, thousands of young men have been partially or wholly deafened in the military service. The various rehabilitation agencies and services, both public and private, have been actively engaged in studying many aspects of hearing loss. They include the study of causes, surgical and other medical means of restoration, speech development, and use of hearing aids. Many of these newer techniques may eventually be adapted for use with deaf children.

There are several national organizations to promote the education of the deaf and the hard-of-hearing. The American Hearing Society and the Volta Speech Association for the Deaf have their headquarters at the Volta Bureau in Washington, D. C. Other organizations include the American Institute for the Deafened, the American Speech and Hearing Association, and the National Association of the Deaf. Many service clubs have local projects in behalf of the deaf.

The Blind-Deaf

The handicap of blindness alone or of deafness alone is very serious yet there are many individuals who are both blind and deaf. The 1930 Census reported a total of 1,942 blind-deaf, and other estimates state that there are several hundred. At least two of these cases became famous. One was Laura Bridgman, whom Howe took into the Perkins Institution for the Blind as a young pupil in 1837, and Helen Keller, who has achieved great fame for her remarkable learning under the leadership of her companion and teacher, Ann Sullivan Macy.

There is no one way in which the blind-deaf may be taught. Combinations of all the various devices helpful in teaching both the blind and the deaf should be used skillfully. Tactual methods or those depending upon the sense of touch are a common approach for both types of defects. Rocheleau and Mack [1] note that up to a few years ago nothing had been done for the blind-deaf as a class and that there were no teachers especially trained in their education.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Discuss orally or in writing any firsthand experiences which you may have had with any deaf persons and interpret them in the light of problems discussed in this chapter.
2. Discuss the distinction in definition between the totally deaf and the hard-of-hearing.
3. Make a detailed drawing of the ear and describe its various parts and their functions.

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[1] R. Mack and C. Rocheleau, *Those in the Dark Silence*, The Volta Bureau, Washington, D. C., 1930, 169 pp.

4. Report in more detail about the history of the education of the deaf as described in Vol. I of Frampton and Rowell's *Education of the Handicapped.*
5. Discuss some famous contemporary deaf persons and their contributions to modern society.
6. Read and report on *The Life of Helen Keller.*
7. Conduct an experiment in lip reading from a soundproof room and note the impressions and difficulties which are encountered.
8. With various members of the class, demonstrate the use of the manual alphabet, noting the individual differences among them in making the various letters accurately and rapidly.
9. Visit a school for the deaf and observe the various phases of the total program.
10. Make contacts with the local luncheon clubs to learn what they are doing for the deaf and report it to the class.
11. Visit the clinic of a local ear specialist and, if possible, have a demonstration of the various types of apparatus which he uses.
12. Make a list of bulletins and pamphlets which have been produced by various organizations interested in teaching the deaf.

Chapter IX

DEFECTIVE SPEECH

It is always a difficult problem to find a satisfactory place in which to allocate speech defectives in a classification of exceptional children. They offer a combination of difficulties and disabilities which are physical, social, and emotional. In the majority of cases there is some physical or physiological basis which tends to classify them among the physically handicapped. As a group, they tend to have more psychological and emotional conflicts than any other type of physically handicapped, since speech is the chief avenue of social communication. When this road of social intercourse does not function in normal ways, barriers are set up between the speech defective and his associates which generate emotional difficulties. Deaf persons, the blind, the crippled, and many other types of handicapped as well, have certain emotional disturbances which arise from their social isolation. They are usually not so noticeable nor so marked as in the case of speech defect. Most of this difference arises from the fact that blindness or crippled conditions are physically obvious and understandable to others, whereas a superficial and snap judgment about the speech defective is that he does not need to be that way if he would merely concentrate. Nothing is farther from the truth about speech defectives.

Actually there should be little concern over the placing of any handicapped child in an arbitrary classification of handicaps since it is desirable to study the whole child in his physical, social, mental, and emotional traits and to understand him as a successful human being. Every child is a combination of many influences which must be understood in the total or complex, as well as in single phases.

Definitions

Speech difficulties arise from so many sources, are of so many kinds and degrees, and have so many attendant by-products, that simple, concise definitions are difficult to formulate. Pintner, Eisenson, and Stanton [1] offer the following:

> Speech may be considered defective when it is not easily audible and intelligible to the listener. Speech is defective if it is vocally or visibly unpleasant or labored in production. Finally, speech is defective if it is inappropriate to the individual in regard to his mental and chronological age, sex, and physical development.

In considering speech difficulties there is need to distinguish between disorders and defects of speech. West, Kennedy, and Carr [2] make the following distinction:

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> These terms *disorders* and *defects* should be differentiated. The former is the more comprehensive; it takes into consideration not only the atypical acoustic end result, but also the underlying condition causing it. The latter considers only the acoustic end result. Further, a distinction may be made between (1) those defects that are also classifiable as disorders and (2) those that are defects merely. If the cause is an abnormality, the defect is classifiable also as a disorder; but if no abnormality underlies the speech defect, the term *disorder* should not be used to describe it.

The Elements of Speech

ss of speech

In order to understand the problems of defective speech it is necessary to understand the process of normal speech. Speech has four main aspects: (1) the voice, or the phonation, (2) the articulation, (3) the linguistic, and (4) the auditory. Since each of these four aspects has many variables, speech is a truly complex process.

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The seat of the voice is primarily in the larynx or voice box in the throat where the vocal cords are housed. The tissues of the larynx continue to harden as one grows older so that the voice of a middle-aged person differs from that of a youth, and old age has its characteristic voice as well. The changing voice of the adolescent boy is a well-known phenomenon from the higher pitch of childhood to a lower pitch at various embarrassing and unpredictable moments.

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[1] R. Pintner, J. Eisenson, and M. Stanton, *The Psychology of the Physically Handicapped*, p. 320.

[2] R. West, L. Kennedy, and A. Carr, *The Rehabilitation of Speech*, (Rev. Ed.) Harper and Brothers, New York, 1947, p. 7.

In the area of articulatory troubles, the inability to hear faint sounds of high pitch offers one of the first problems. The child makes substitutions for these sounds in his own speech. Later he must relearn when he actually does hear them. A second factor in articulation is the ability to remember and distinguish certain sounds from others so that he may reproduce them himself. A third factor is the slower tempo of muscular movement in a child than in an adult so that he cannot execute speech so rapidly nor learn it so rapidly as he might if it were timed to his childhood rate. A fourth problem is the specialization of movement of particular muscles to get the exact effect that is necessary for correct speech. The inaccuracies of speech of the totally deaf or hard-of-hearing are based in part upon this difficulty as well as upon limited powers of hearing correct speech.

According to West, Kennedy, and Carr,[1] the linguistic aspects are related to intelligence which is largely innate, to symbolization or the faculty of associating some object with a purely arbitrary symbol, to attention span, and to emotional control. Since each of these four factors are somewhat complex, it may be readily seen that the linguistic aspect of speech is not easily developed.

The auditory aspect is primarily of a social nature since it is concerned with what the child hears in the speech of his close associates. Parents who stutter or lisp or those who speak brokenly because of a foreign tongue provide incorrect models which children are likely to imitate.

Unless all four of these main elements function correctly, each separately in all of its phases, as well as working together harmoniously, speech will have some defect or disorder. The power of speech is ordinarily taken for granted, but it is only when speech does not function normally and attempts are made to discover why, that the full significance of speech and its mechanisms are understood.

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[1] West, Kennedy, and Carr, *ibid.*, pp. 51–56.

Methods of Diagnosis

In order to introduce the problem of defective speech, a sevenfold classification of defects and observable symptoms is offered, as outlined by the Michigan committee in their bulletin on *Helping the Exceptional Child in the Regular Classroom:*[1]

1. *Stuttering or Stammering:* A disturbance in the rhythm of speech. Observable symptoms are:
   a. Intermittent blocking in the speech mechanism
   b. Repetition of sounds, syllables, word phrases
   c. Visible body tensions
   d. Silent stammering where there is no visible attempt to speak—child appears stubborn and negative, but actually experiences blocking
   e. Random body movements and facial contortions.
2. *Oral Inactivity:* Distortion of speech due to sluggishness of some part or parts of the speech organs. Observable symptoms are:
   a. Poor bodily coordination
   b. Omission of normal speech sounds—often the final sound
   c. Substitution of non-speech sounds
3. *Lisping:* A form of oral inactivity in which sibilant sounds are made incorrectly (s, z; sh, sz, etc.) or sound substitutions. Observable symptoms are:
   a. Lingual protrusion (tongue protrudes between front teeth) known as lingual lisping
   b. Emission of sound over the sides of the tongue—known as lateral lisping
   c. Emission of sound through the nose—nasal lisp
   d. Substituting the *t* or *d* for the *s* or *z* sound—occluded lisp
4. *Aphasia:* Defect or loss of the power of expression by speech, writing, or signs—or of comprehending spoken or written language due to shock, injury or disease of the brain centers. It may appear as one or a combination of these symptoms listed below:
   a. Complete or partial inability to speak but can comprehend meaning
   b. Inability to comprehend meaning or words although they may be able to repeat the word

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[1] F. E. Lord, *Helping the Exceptional Child in the Regular Classroom,* Bulletin No. 315, Superintendent of Public Instruction, Lansing, Mich., 1941, pp. 27–28.

   c. Speech may appear as a jargon of words which take on meaning when carefully analyzed
   d. Lack of grammatical form

5. *Disorders of Voice:* Failure to produce normal speech tones due to structural or functional causes. Observable symptoms are: husky, weak, nasal, shrill, aspirate (breathy), monotonous, etc., quality of voice
6. *Baby Talk:* Substitution of one normal speech sound for another caused by a slight interruption in the growth process or by poor speech environment
7. *Foreign Accent:* The influence of a language other than English —observable symptoms are:
   a. Omission, substitutions of sounds and syllables
   b. Changes in the rhythm, melody and accent

Diagnosis of speech disorders and defects is a complicated process, and involves more than merely naming the difficulty lisping, baby-talk, stuttering, or determining whether initial or final letters of particular words are mispronounced. There are at least three phases or parts of diagnosis which should be covered intensively, each in and of itself and with respect to the other two parts, since they are closely interrelated in any individual.

The first area is that of medical diagnosis in which all physiological abnormalities or obstructions are given maximum care and surgery if necessary. The orthodontist, or specialist in malformations of teeth, should be a part of this program as well as the neurologist who may study and correct neurological conditions. The clinical specialist in speech should be consulted with regard to physiological conditions since in some cases the speech difficulty may arise from causes other than the physiological one alone.

The second area is primarily psychological, involving the linguistic phases noted in the previous section. Emotional disturbances are exceedingly influential and closely related to speech problems. Social and family backgrounds contribute to this picture. For example, a child who has rejections, cruelty, and jealousies at home may develop a speech defect from his emotional blockings. The correction should proceed along the social and psychological lines but paralleled in classroom therapy by the speech teacher for the specific defects themselves. Emotional disturbances may arise from the speech defect itself. In the beginning the difficulty may be primarily speech defect, but the frustrations, ridicule, and social rejection cause emotional upsets. After these episodes rise to an aggravated state they then begin to be primary causes for continuation of speech defects. The child is so overwhelmed by the effects of his earlier failures that he is practically defeated in his speech efforts before a single word or syllable is uttered. In the absence of adequate social and psychological services the teacher of speech correction carries on with these phases and correlates them with her more specific problems of the speech defect itself.

3) The third major phase is the correction of errors in the speech itself, by a detailed program of specific therapies. A thorough knowledge of the physiology of speech is fundamental so that the characteristics of total speech mechanism are known and just how they operate normally or abnormally in each individual. The correction of particular errors is only one function of the process. The improvement in specific aspects of speech eventually brings about added confidence, releasing emotional tensions. Improvement spreads to many fields, including the regular classroom work in school subjects, social acceptance by associates, and a new outlook on life. The therapy in the process of speech correction becomes effective in emotional and psychological fields as well. Diagnosis in the true sense of the word involves all of the factors and fields which have just been cited.

Characteristics of Speech Defectives

It will have been noted from the discussions up to this point that speech defectives have complicated problems in many fields, interrelated in very intimate and paradoxical ways. Some further evidence in certain fields relating to the characteristics of speech defectives will now be presented.

Intelligence. In line with other types of exceptional children speech defectives tend to measure below the average I.Q. of 100 in intelligence. The crippling effect of any physical handicap upon the normal development and functioning of intelligence tends to come to light, more and more, as the various types of handicaps are considered. In view of the general over-all effect of any handicap upon the individual it is surprising to find that the handicapped, as a group, measure as well as they do in intelligence, educational achievement, and similar qualities.

Sirkin and Lyons[1] examined 2500 institutionalized mental defectives and found that only one-third of them spoke normally, with speech defect twice as frequent among males. The lower the intelligence, the fewer cases of normal speech. Correction was unsuccessful below the moron grade with a minimum mental age of five years, six months. Types of speech defects in order of frequency were: sound substitutions and defective phonation from habit, lisping, monophasia, lalling, organic, mixed, stammering, voice disorder, stuttering, and bradyphasia.

In one of the larger surveys involving a school system of about 90,000 children, Wallin[2] noted that 26.3 per cent of the pupils in special classes for the mentally deficient had speech defects as compared with 2.8 per cent in the regular grades. It should not be inferred that since many of the feebleminded have speech difficulties and inadequacies, all cases of speech disorder must also be of limited intelligence. Pintner, Eisenson, and Stanton[3] studied the intelligence of stutterers and concluded that they were approximately normal in intelligence.

Practically no published reports are available on the intelligence of large numbers of school children with speech defects since the White House Conference Studies in 1930. Unpublished reports from the Speech Correction Department of the Detroit Public Schools showed a median I.Q. of 99 on Detroit group intelligence tests for 6642 pupils in the school year 1938–1939. The distribution of intelligence approximated that for unselected pupils with only a small skewness toward the lower end of the scale. The survey was repeated in the school year 1947–1948 with an approximate median I.Q. of 97 on 9182 pupils, which continues to be well within normal mental limits. It will be noted that the latter survey had nearly fifty per cent more pupils and probably included a larger number of slow-learning children continuing in school.

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[1] J. Sirkin and W. F. Lyons, "A Study of Speech Defects in Mental Deficiency," *American Journal of Mental Deficiency*, 1941, **46**, pp. 74–80.

[2] J. E. W. Wallin, *Clinical and Abnormal Psychology*, Houghton Mifflin Company, Boston, 1927, pp. 454–455.

[3] R. Pintner, J. Eisenson, and M. Stanton, *The Psychology of the Physically Handicapped*, p. 323.

Personality. Individual observation and case-study methods with young children have proved generally that speech defectives have many personality maladjustments. Most of the experimental studies with the use of personality schedules have been confined to college students for whom such tests are more adequately adapted. Templin[1] used the Moore-Gilliland Test for aggressiveness on the normally speaking and on students in the speech clinic at Purdue University and found the latter group somewhat less aggressive, but with differences so small as to be considered statistically insignificant. McDowell[2] used a series of tests on forty-six stutterers and a matched group of nonstutterers with no significant differences between the two groups. Johnson[3] used the Maturity section of the Woodworth-House Mental Hygiene Inventory on eighty male and female stutterers, from seven to forty-two years of age, and found unfavorable differences in regard to health, nervousness and irritability, shyness, vocational anxiety, secretiveness and depression, and in the feeling of satisfactory adjustment to life.

Hawk[4] discussed the uses of personality measurement in the complete diagnosis and treatment of speech correction cases. In addition to the survey of many of the more commonly used tests, she cited several typical cases in which the test information furnished many clues to emotional problems which might otherwise have not been discovered.

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[1] M. A. Templin, "A Study of Aggressiveness in Normal and Defective Speaking College Students," *Journal of Speech Disorders*, 1938, **4**, pp. 43–49.

[2] E. D. McDowell, *Educational and Emotional Adjustments of Stuttering Children*, Teachers College Contributions to Education, No. 314, Columbia University, New York, 1928, 59 pp.

[3] W. Johnson, "Influence of Stuttering on the Attitudes and Adaptations of the Stutterer," *Journal of Social Psychology*, 1934, **5**, pp. 415–420.

[4] S. S. Hawk, "Personality Measurement in Speech Correction," *Journal of Speech and Hearing Disorders*, 1948, **13**, pp. 307–312.

Personality characteristics and emotional problems in stutterers under the age of five were reported by Glasner[1] on seventy cases which showed three main types: A healthy, aggressive type with emotional pampering and criticism from a relative suddenly coming into the family; an ungainly, awkward type with brilliant parents and a whole constellation of emotional disturbances because of hostility from one or the other parent; and a dependent, confused and worried type. The author feels that such children have a long background of overprotection and pampering, and over-anxious, excessive perfectionistic parents. He believes that little has been accomplished in the field of preventive therapy with a great need for treatment of stuttering in children under the age of five years.

5-10%.

Number of Speech Defectives

Speech defectives mount into large numbers when the entire country is considered. It is only by surveying upon such a comprehensive basis that the real significance of any handicapped group becomes apparent. Otherwise, the presence of one or two, even in a very extreme state in a classroom, does not create an awareness of the entire group.

The Sub-Committee on Special Classes of the White House Conference[2] dealing with defective speech made a careful attempt to estimate the number of cases by two methods. They sent a questionnaire on speech defectives to all cities with general populations of ten thousand or more. A very small per cent of them were returned by forty-eight cities of various sizes in many parts of the country. However, these returns probably gave a representative sampling of the situation. When they divided the total school population of the cities into the number of reported speech defectives, 5 per cent were defective;

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[1] P. J. Glasner, "Personality Characteristics and Emotional Problems in Stutterers under the Age of Five," *Journal of Speech and Hearing Disorders*, 1949, 14, pp. 135–138.

[2] White House Conference, *Special Education: The Handicapped and the Gifted*, pp. 353–356.

on a country-wide scale this number would have amounted to 1,177,893 at that time. The median per cent by cities arranged in order of largest to smallest percentage was 6.9 and would yield 1,625,493. As a result the committee decided that 1,000,000 would be a reasonably conservative estimate.

Frampton and Rowell [1] state that there are 8 per cent of the children in New York City who need speech correction, or a total of 27,000. Mills and Streit [2] made a speech survey of the 4685 public school pupils of Holyoke, Massachusetts. All of the pupils in grades 1, 2, and 3 were tested and in the more advanced grades pupils were referred by their teachers or discovered by the examiners. 10.1 per cent of all pupils were found to have some speech defect.

In a recent report Wendell Johnson [3] comments on the number of speech defectives as follows:

> There should be one speech correctionist to approximately every 4000 pupils. Estimating *very conservatively* that only 5 per cent of the pupils will be found to have significant speech problems, there will be 200 children needing speech correction among every 4000 pupils. Some of them, possibly half, can be handled by their regular classroom teachers, with consultation and supervision by the speech correctionist. The rate of improvement and dismissal will then tend to keep the load of individualized and small-group cases in an enrollment of 4000 down to a number—75 to 100—that one speech correctionist can handle efficiently.

In the school year 1950–1951, there were 46 speech correction teachers in the Detroit Public Schools, with an average of 214 pupils per teacher. For the school year 1951–1952 the annual Spring survey made by the regular classroom teachers of new cases, subsequently examined and approved by the speech correction teachers, plus the pupils continued from the preceding year, made a total of 16,148 or approximately seven per cent of the total school enrollment.

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[1] M. E. Frampton and H. G. Rowell, *Education of the Handicapped, Vol. II, Problems*, 1940, pp. 238–239.

[2] A. W. Mills and H. Streit, "Report of a speech survey, Holyoke, Massachusetts," *Journal of Speech Disorders*, 1942, 7, pp. 161–167.

[3] W. Johnson, "Speech Handicaps," National Society for the Study of Education, Forty-ninth Yearbook, Part II, *The Education of Exceptional Children*, The University of Chicago Press, 1950, Chapter X, pp. 185–186. Quoted by permission of the Society.

Causes, Remedies, and Preventions

There are many types of speech defects and disorders and there are also many causes. In only a few instances is it possible to relate a specific disorder to one specific cause; usually several are interrelated. However, these difficulties are by no means unsurmountable, which will be discovered as this discussion continues. As a general plan, certain of the more common causes will be presented, to be followed by some remedial suggestions.

Hearing defects. In the two preceding chapters on the hard-of-hearing and the deaf there was constant reference to speech difficulties due to imperfect hearing. Speech develops in large measure by following the examples of speech in others and totally deaf people formerly did not learn to talk on account of that reason. For centuries it was assumed that they lacked the power and facilities for speech, but in the past few decades many deaf children have learned to speak in quite normal ways through the knowledge and training in the mechanisms of speech. Unfortunately, this intensive program for the totally deaf has often been overlooked for many who are hard-of-hearing or whose hearing defect had not been discovered. In connection with hearing defects it was shown that deficiency often came at certain points of frequency of vibrations or pitch of tones. Whenever the voice of the speaker was tuned to these levels either for words, sounds, or the general level of speaking, gaps occurred in the hearing and hence in the ability to reproduce sounds at those levels. Certain sounds in speaking have more air pressure than others which may be neutralized by defects of the tympanum of the ear. Various methods of producing and of amplifying speech have been cited in earlier chapters and need not be repeated here. Although the White House Conference statistics on causes of speech defects show less than 1 per cent due to impaired hearing, in view of the great number of hearing defect cases it would seem logical that that number should be much greater.

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Defective intelligence. One of the three main aspects of speech was linguistic, or a code of meanings, primarily concerned with verbal thought. Since mentally retarded and feeble-minded persons are usually deficient in meanings, it is natural that they should be limited in speech, prone to errors and defects, even without physiological disorders. In a later chapter on the feeble-minded, various characteristics will be discussed. In addition to mental limitations certain of their physiological characteristics will also be considered. It is sufficient to state that feeble-mindedness is a potent cause of speech defect, although the majority of speech defectives are not feeble-minded.

Physiological defects. Speech defects are caused from mouth disorders, nasal obstructions, deformities of the throat including the pharynx and larynx, and general bodily weakness. Malformations of the tongue, teeth, lips, palate, high arched roof of the mouth, adenoids, and the vocal cords may each contribute singly or two or more in combination to some defect in speech production. The diagnosis and treatment of such conditions naturally falls to the medical specialist for whatever surgery or physical treatment he deems necessary. The reeducation of the child in the proper use and development of speech falls to the speech clinician and speech teacher. Such problems always demand friendly cooperation.

Central-nervous-system disturbances. The process of speech involves the coordination and interrelation of many mental functions and processes—auditory, visual, motor, associative meanings, the formulation of thoughts, and others. This coordination takes place in the central nervous system located in the brain. Whenever disease or injury affect the structure of the central nervous system, disturbances of speech take place, including such causes as meningitis, brain tumors, chorea, and cerebral palsy or spastic paralysis. Of a somewhat less severe neurological nature is the failure to develop natural right or left-handedness with its accompanying disturbance between the motor area of the brain and the Broca speech center. The social consequences of defective speech and the educational consequences of reading disabilities from these handedness confusions are very grave. This problem will be discussed in a later chapter.

Psychogenic disorders. The word "psychogenic" implies originating in the mind. It is different from the central-nervous-system disturbances in which some actual injury or deterioriation of the brain tissue was involved. It is of a mental nature and may be without a physiological basis. It arises from such social conditions as unusual home conditions, emotional blockings, or the effect of some abnormal physical factor such as facial scars or homeliness. The speech defect may take a form similar to that arising from some physiological disability but without such disability being present. It often presents such profound effects that stuttering takes place, which is a manifestation of the disturbance.

There are many kinds of speech defects which arise from the various causes noted above. Among them are special articulatory defects, indistinct speech, undesirable concomitants of speech, emotional retraining, stuttering, vocal disturbances, spastic speech, influence of a foreign language, and others. It is not within the scope of this presentation to consider all of these remedial procedures in detail. Readers are referred to an excellent and thorough discussion by West, Kennedy, and Carr [1] entitled *The Rehabilitation of Speech* for both diagnostic and remedial procedures.

In order to illustrate the relationships of diagnostic to remedial procedures, Table VI has been prepared from material suggested by West and others.

Wherever an "x" occurs in Table VI it denotes that the diagnostic procedure at the left is related to the remedial procedure at the top of the table. For example, "psychogenic disorders" has remedial suggestions in eight areas as noted in the table, with the total at the right. By reading horizontally in the table with respect to any diagnostic procedure at the left, it may be noted how many and what areas of prescription are related to it as per the topics across the top of the table. Likewise, the relation of the prescription to diagnostic procedures may be read down any column. For example, "special articulatory defects" are related to seven

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[1] R. West, L. Kennedy, and A. Carr, *The Rehabilitation of Speech* (Rev. Ed.), Harper and Brothers, New York, 1947, 650 pp.

TABLE VI

RELATIONSHIP OF PATHOLOGY TO REMEDIAL PROCEDURES[1]

Speech Pathology	*Remedial Procedures*											
	Special Articulatory Defects	*Dyslalia-Speech Difficult of Perception*	*Undesirable Concomitants of Speech*	*Speech Defects of Psychogenic Origin*	*Stuttering*	*Rhinolalia*	*Speech Defects Associated with Oral Deformities*	*Vocal Disturbances*	*The Cerebral-Palsied*	*Aphasia*	*Remedial Procedures for Children*	*Total*
Psychogenic disorders.......	x	x	x	x	x	x	x	x				8
Spasmophemias.............		x	x	x	x							4
Dyslalias caused by mouth disorders................	x	x	x			x	x					5
Rhinolalias caused by nasal obstruction..............	x	x	x			x						4
Dysphonias................								x			x	2
The neuropathologies of speech	x	x	x		x	x		x	x	x		8
Speech defects of the feeble-minded.................		x										1
Dyslalias caused by deficiencies of hearing	x	x	x					x				4
Disorders of speech perception				x								1
Foreign accent.............	x											1
Infantile speech.............	x	x										2
Total.................	7	8	6	3	3	4	2	4	1	1	1	40

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[1] West, Kennedy, and Carr, *ibid.*, pp. 275–276.

different areas of diagnosis. The general importance and infiltrating influence of any diagnostic or prescriptive area may be determined roughly from the number of times it occurs as a cross reference in the table.

It is not to be implied that this table suggests logic-tight compartments, but rather some general trends in relating diagnosis to prescription. It is also designed to give a comprehensive view of the interrelationship of many factors in the causes and remedies of speech defects and disorders.

History of Speech Defectives

There was never any overwhelming sentiment for speech defectives such as often attended the blind and to some extent the crippled. In early historical times speech defectives were often the object of taunt and ridicule. Since they managed to get along somehow in school and in life, their plight from an educational and vocational point of view did not become very apparent until the beginning of the twentieth century.

Famous characters. As in the case of other defects there were many famous men who had defects of speech. Among them was the Greek orator, Demosthenes, who is said to have learned to orate clearly with pebbles in his mouth so that he would have a reserve power of clarity; he talked beside the ocean surf until he could be heard above its din and roar. There have been various stories to the effect that he could not pronounce *s* but produced *f* instead, that he could not pronounce *r*, and that he lisped and stuttered.

Moses tried to beg off as lawgiver, describing himself as "slow of speech and of slow tongue" (Exodus IV: 10). Aristotle, Virgil, Charles Lamb, Erasmus, and other famous learned men and writers were reputed to have had speech defects, which was also true of Napoleon and probably to a slight degree of Washington. As in the case of other defects, speech disability frequently impelled men to great achievements. These deeds often serve as a guide and incentive to those who are handicapped today.

Methods of diagnosis. Although little was done about defects of speech from an educational point of view in early times, there were various theories as to causes and medical treatment. Hippocrates, about 400 B.C., was probably the earliest physician to mention it to the effect that stammerers with voluble tongues are full of black bile. Others believed that there was too much heat in the body, particularly in the tongue, a view somewhat similarly expressed by Guy de Chaulliac, a French physician, in the fourteenth century. When one considers the emotional disturbances of many speech defectives, any bodily accompaniment such as blushing or bodily agitation might easily have been attributed to the mysterious fluids which were supposed to be found in the human body.

In the period from 1500 to 1800 [1] there were advances along the line to the extent that some authorities considered certain speech defects to be of a psychological nature. Advances were also made in the direction of the physiology of speech disorders. Johann Friedrich Dieffenbach (1792–1847) attempted an erroneous procedure of some muscular surgery on speech defectives which did not produce desired results but which were a forerunner of later and more successful surgery.

In 1861 Broca claimed to have localized an area of the brain as the seat of articulated language, and this area was later known as Broca's area. In America, Alexander Melville Bell and later, his son, Alexander Graham Bell, made progress in using Visible Speech symbols to teach speech, particularly to the hard-of-hearing and the deaf. In the present century various medical and educational approaches were made, leading to the current information about the many possible causes of speech defects and disorders.

Establishment of classes. The first class to be organized for speech defectives seems to have been established in Potsdam, Germany, about 1887. A few early classes or schools in America were private ventures. The first public-school class in America was established in Public School No. 2 in New York City in 1908. Chicago followed in 1910 with six teachers and Detroit also started that same year. As noted earlier, in 1939–

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[1] M. E. Frampton and H. G. Rowell, *Education of the Handicapped, Vol. I, History*, pp. 94–97.

1940 in the entire country there are 126,146 children enrolled in classes for speech defectives.

Current Problems in Teaching

The general plan for teaching speech defectives is somewhat different from that of most types of exceptional children. They are enrolled in regular classes with normally speaking children but report at one or more times per week for short periods to the special teacher of speech. This type of organization helps to minimize the psychological and social effects of the disability, since rehabilitation is carried on gradually while the child is enrolled with the regular class. The teacher usually travels to two or more schools and is able to handle a much larger group of children in the course of any week's schedule than if she had full charge of a group for instruction in all subjects. She concerns herself primarily with a child's speech condition, rather than with subject matter of instruction.

In the Detroit system the speech teacher takes not more than ten pupils at a time and preferably a smaller number for about thirty-minute periods, depending upon the type and severity of handicap. Many types of self-practising material have been developed so that the pupil may proceed somewhat independently with his own drill exercises but under the teacher's supervision. Certain types of material and exercises for posture and breath control are taken by the entire class.

Detroit speech teachers reserve one day of the five each week for coordination activities. They visit the child in his regular room and note improvements or progress in that situation which may be different from his response in the speech class. Conferences are held with the regular teachers about his problems, and these are supplemented by conferences with parents either at school or by home visits. Contacts are maintained with hospitals and medical staffs who have been concerned with the physiological and neurological conditions. Obviously, some time must be given to individual case records on the many phases of the child's problems if success is to be achieved.

This type of education for the speech defective averages in Detroit $29 per year in addition to the cost of regular education. The expense is a minimum figure as compared to that necessary to help other types of the handicapped. However, expenses for other groups are necessarily gauged to the nature of defects, special equipment, and other basic factors. The traveling speech-teacher plan is practical administratively, and activities may be expanded or shifted at will, depending upon the size of the school system and the distribution of children with speech defects. If a system is small, a teacher may be employed who devotes part time to speech correction and the remainder to teaching some regular subjects of the curriculum. If any small school system wishes to make a start in an educational program for exceptional children, speech defectives offer a most logical and easy group with which to begin.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Describe the condition of any speech-defective person you have known, in the light of this chapter.
2. Study and report on a good diagram of the physiology of the speech organs.
3. Discuss some of the more unusual causes of speech disturbance and give an interpretation.
4. Visit a speech correction class and have a demonstration of the work.
5. Report on some specific remedial exercises and how they function in speech correction.
6. Report on a more inclusive list of famous historical characters who had speech defects.
7. Make an annotated bibliography of recent books on speech correction.

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Chapter X

ORTHOPEDIC HANDICAPS

The problem of children with orthopedic handicaps has been recognized somewhat more recently than problems of some other types of exceptional children. The term "orthopedic" is of comparatively recent adoption; the public continues to use the more familiar term "crippled." For many years orthopedic handicaps have been chiefly the problem of individual families, their family physicians, and orthopedic surgeons. Their problems have tended to be concealed within the privacy of the home, seldom discussed outside of the family circle, and frequently the patients have been kept in partial seclusion. It is only in recent years that the emphasis has been directed toward educational provisions for them and their problems brought out for more general consideration. On account of the fact that they are a combination of medical, educational, and home problems, responsibility has not been centered at one point as in the case of many other types of handicaps.

A significant consideration centers around the various degrees of the handicap, ranging from minor disabilities to bedridden conditions. In the former, education has proceeded with that of the nonhandicapped children although it might have been more profitable in special schools or classes for the orthopedic. The most extreme cases were given a little education at home or else their training was neglected altogether. A further difficulty of identification lay in the fact that orthopedic defects occurred in various parts of the body with no definite localization such as in the eyes, in the case of blindness. For many reasons, children with orthopedic defects were not identified as a distinct group until comparatively recent years.

Finding Crippled Children

Since crippled children are becoming identified as a group, many agencies and organizations are constantly on the alert to find them. Many classroom teachers are observing them not only as to their obvious defects such as loss of an arm or as walking with a limp, but also the poor motor control or coordination of the cerebral-palsied child, or the child whose slow movements are due to painful infections in bones or joints.

In every state and territorial possession of the United States the case-finding agencies of public health nurses and crippled children's services hold many diagnostic clinics through which many crippled children are found. These sources are augmented further by hospitals, family physicians, medical societies, the clergy, and by parents who are becoming much more health-minded through their own educational experiences, and through the mediums of the press, movie, radio, and television.

Definitions

There are many definitions of orthopedic or crippled conditions, originating from different approaches or points of view. One of the most comprehensive definitions was proposed by the Joint Sub-committee of the White House Conference on Child Health and Protection.[1]

> A crippled child is one, under twenty-one years of age, who by reasons of congenital or acquired defects of development, disease or wound, is, or may be reasonably expected to become, deficient in the use of his body or limbs (an orthopedic cripple) including hare lip, cleft palate, and some other handicaps yielding to plastic surgery, and excluding physical difficulties wholly of sight, hearing, or speech, and those affecting the heart primarily, and also excluding serious mental or moral abnormalities unless found in conjunction with orthopedic defects.

In several states where acts have been passed enabling boards of education to establish special orthopedic schools or classes, the definitions are approximately as follows: "One

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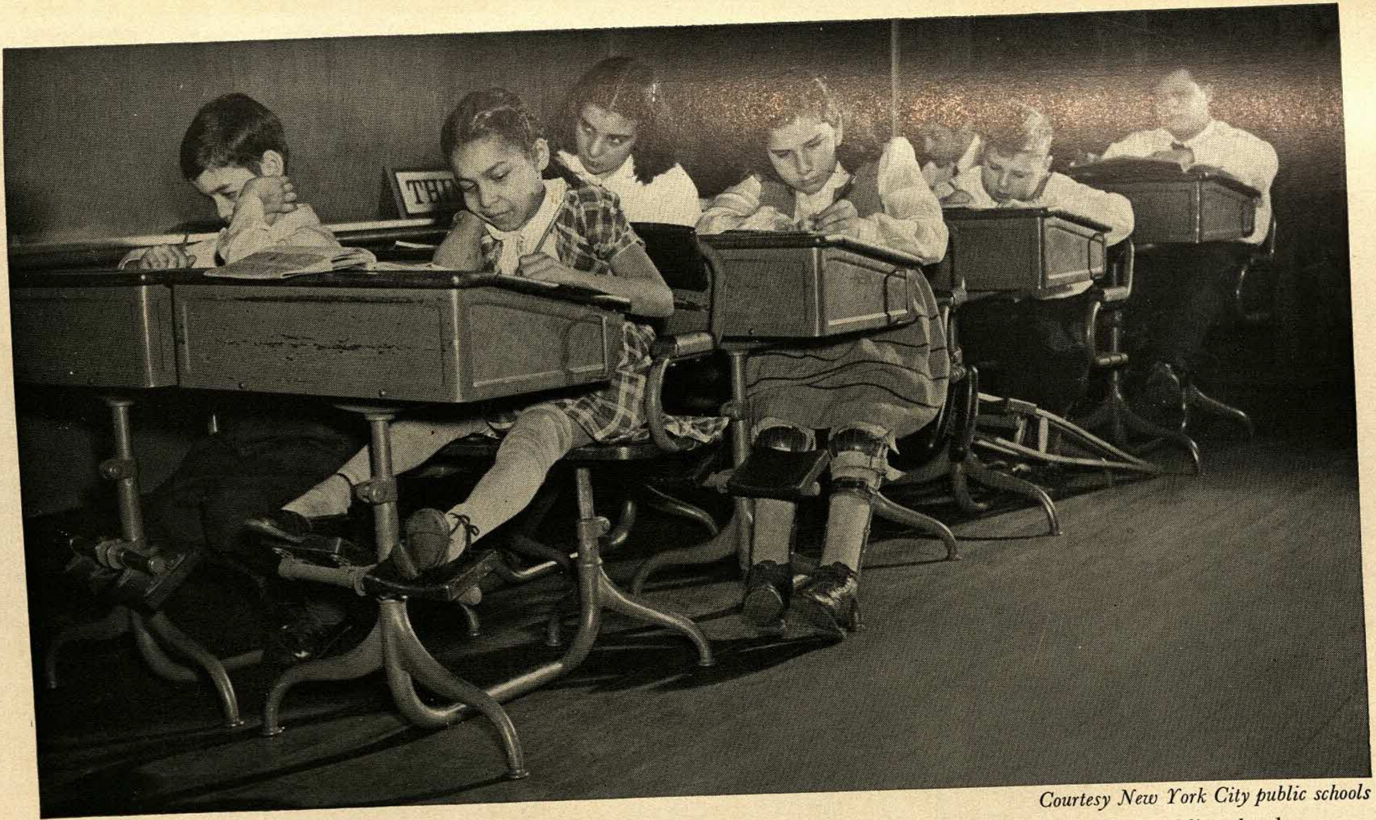
[1] White House Conference, *The Handicapped Child*, p. 119.



Courtesy New York City public schools

An orthopedic class illustrating foot rests adjustable to individual orthopedic defects, New York City public schools.

Courtesy Odessa public schools

Physically handicapped class in the public schools of Odessa, Texas.

whose activity is, or due to progressive disease, may become, so far restricted by loss, defect or deformity of bones or muscles, as to reduce his capacity for education or self-support." This type of definition tends to restrict the cases to more severe types, but there is usually rather liberal interpretation in individual cases.

In the final analysis, definitions must have a broad interpretation. In all the fields of the handicapped, practical experience with hundreds of cases by the diagnosing specialist becomes a more dynamic guide than is any arbitrary limit from a formal definition. The human element of the individual case always sounds the basic keynote of consideration in dealing with handicapped and exceptional children.

Characteristics

There have been some studies of the characteristics of orthopedic children which will be summarized as to personality, intelligence, home, and family status.

Personality and character. Nagge and Sayler[1] used the Neymann-Kohlstedt test of introversion on 144 children and matched them with a control group of nonhandicapped as nearly as possible for sex, age, and race. There were no significant differences between the two groups in introversion and no relationship between introversion and the length of time crippled. Kammerer[2] studied eighty children who were patients in a hospital, fifty suffering from osteomyelitis and the remainder from scoliosis, and coming generally from lower socioeconomic levels. The presence of the physical handicap alone did not appear to be a sufficient determinant of personality or social maladjustment, and these occurred mainly when other types of factors were also present. Baker[3] noted strong emotional attitudes in child and parent by the appearance of the physical deformity, by the need of surgical treatment, and by the tendency to rejection by other children. All of these issues require a continuous, consistent coordination of planning and activities by public and private health, welfare, and educational agencies.

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[1] J. W. Nagge and R. H. Sayler, "Physical Deficiency and Extroversion-Introversion," *Journal of Social Psychology,* 1933, 4, pp. 239–244.

[2] R. C. Kammerer, "An exploratory Psychological Study of Crippled Children," *Psychological Record,* 1940, 4, pp. 47–100.

[3] E. M. Baker, "Some Social Needs of the Crippled Child," *Crippled Child,* 1940, **17,** pp. 68–71.

Strother[1] stressed the fact that if constructive attitudes and wholesome personalities are to be developed there must be complete emotional acceptance of the child by his parents, and they must provide emotional security. Crippled children must develop a feeling of self-respect and self-confidence in his relations with his physical environment, as well as a constructive philosophy of life.

Cruickshank and Dolphin[2] administered the Rath's Self Portrait-N Test to 87 children with orthopedic or neurological defects. Aside from a slightly higher need upon the part of boys for achievement there were no statistically significant differences in scores between boys and girls. In this group the needs for love and affection were "overmet." Cases of cerebral palsy and poliomyelitis had more feelings of fear than those with cardiac conditions, and the group as a whole wanted a larger share in making decisions for themselves.

Intelligence. Arlitt and Fernald[3] tested 194 crippled children in Cincinnati and on the first test found a mean I.Q. of 82, and a correlation with a second test of .90. There is no clear relationship between level of intelligence and onset of crippling, but with some tendency to decrease as the degree of crippling increases. Lee[4] tested 148 children in the Children's Orthopedic Hospital in Seattle with a mean I.Q. of 86.8. Witty and Smith[5] reported the testing of 1480 crippled children from the special schools in Chicago, St. Louis, Cleveland, and Toledo with a mean I.Q. of 84.5.

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[1] C. R. Strother, "Developing Personality," *Crippled Child*, 1947, **25, 2,** pp. 18–19; 29.

[2] W. M. Cruickshank, and J. E. Dolphin, "A Study of the Emotional Needs of Crippled Children," *Journal of Educational Psychology*, 1949, **40,** pp. 295–305.

[3] A. H. Arlitt and M. R. Fernald, "A Psychological Study of a Group of Crippled Children of Various Types," *School and Society*, 1935, **25,** pp. 449–452.

[4] M. V. Lee, "The Children's Orthopedic Hospital; A Survey of the Intelligence of Crippled Children," *Journal of Educational Research*, 1931, **23,** pp. 164–166.

[5] P. A. Witty and M. B. Smith, "The Mental Status of 1480 Crippled Children," *Educational Trends*, 1932, pp. 21–24.

In his doctor's dissertation, John J. Lee [1] reported on the intelligence of 619 children in the Oakman School for Crippled Children in Detroit as follows:

TABLE VII

INTELLIGENCE AND TYPE OF DISABILITY

Type of Disability	*Number Tested*	*Median I.Q.*
Spastic	158	83
Cardiac	92	90
Poliomyelitis	106	96
Surgical T. B.	45	92
Osteomyelitis	47	96
Miscellaneous	171	91
Total	619	Med. 89

Lee notes that 3.2 per cent of the group had I.Q.'s of 120 or above, and 28.3 per cent were 100 or above. If the spastic disability group is omitted from the distribution, the median I.Q. of the remainder is 92.6, which is within the limits of the mentally normal. On the whole, the results of all the various investigations show an intelligence level slightly below average for orthopedic children.

Home and family status. The most complete report on this phase of orthopedic children is offered in Lee's thesis [2] on 835 children from the Oakman School in Detroit as follows:

1. Only 71.8 per cent of the children were living with both of their natural parents; 28.2 per cent had broken homes; 4.7 per cent of the fathers were deceased.
2. With respect to the number of other siblings, 59 had no brothers or sisters; 146 had one or two brothers or sisters; 155, or 40 per cent, came from homes in which the families should be considered large; 43 children had step-brothers or step-sisters.
3. Teachers' judgments were obtained on the effect of the home on the child. They reported that, for 21.4 per cent the home

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[1] J. J. Lee, "A Study of Certain Individual Differences Found Among Crippled Children and of Certain Problems Involved in Their Education and Training," Doctor's dissertation, Ohio State University, 1942, pp. 205–224.

[2] J. J. Lee, *ibid.*, pp. 260–263.

was wholesomely stimulating; for 48.9 per cent the homes were ordinarily stimulating; but for 19.6 per cent the homes were lacking in motivation or were unwholesome.

4. Teachers again reported that 2.3 per cent of the homes were not cooperative; that 3.6 per cent of the children were neglected; and that 6.8 per cent were poorly clothed.
5. With reference to the homes and neighborhoods in which crippled children lived, teachers reported that only 5.8 per cent of the children lived in homes that were generally better than their surrounding neighborhoods; that 18 per cent lived in homes that were definitely below neighborhood average; and that 3.6 per cent lived in the very poorest homes in their respective neighborhoods.
6. An investigation of the neighborhoods showed that about 38 per cent of the children lived in areas that would be considered sub-standard; that about 51.6 per cent came from average neighborhoods; and that only about 6 per cent came from areas that would be considered good, average, or better than average neighborhoods.
7. With reference to home ownership and number of former addresses, it was found that only 35 per cent of the parents owned their own homes; that about 58 per cent rented; and that about 6 per cent were provided through relief housing. The number of former addresses showed that 17.7 per cent had moved once; about 35 per cent had not moved since the child entered school; but 45.5 per cent of the children had moved from two to six times.
8. Study of the employment of parents showed that 53.4 per cent of the fathers worked steadily; 4.7 per cent were deceased; 6.2 per cent were unemployed; and 15.8 per cent worked only periodically. In 8.9 per cent of the homes no one was employed.

It was not possible to obtain comparable data on an unselected group of parents and homes of noncrippled children. The above findings were considered sufficient, however, to indicate that there was a large number of socioeconomic problems growing out of environmental influences. They undoubtedly have a bearing on the education and training of crippled children. These influences are generally considered to result in feelings of inferiority, of insecurity, and in negativism. Obviously, where economic levels were inadequate, some parents were not able to provide all of the medical treatment that their children needed. As a result, some handicaps became more severe and permanent than would have been necessary according to existing medical knowledge. Such underprivileged homes provide a very restricted world of experience, with the results that children have not had the usual opportunity for out-of-school learning and maturation. Fully 20 per cent of crippled children work much below their capacity because of the limitations cited above.

Other physical defects. Keller [1] examined 308 of the Oakman School Crippled Children by a group audiometer test and found 6.8 per cent with impaired hearing of over nine decibels. This number is about one-half more than the average of 4.6 per cent among 23,347 children tested by her in 28 Detroit public and parochial elementary and high schools. In the Oakman School general physical examinations are given to all pupils and complete records were available on 567 children. Of this number 21, or 3.3 per cent, had secondary orthopedic handicaps, and a total of 1281 other physical conditions were found, which averages a little more than 2 per child besides the main orthopedic condition. Lee [2] summarizes these defects:

> On the basis of frequency of defects 46.5 per cent had defective teeth; 41 per cent had infected tonsils; 29 per cent had measurable hearing loss in right ear; 23.8 per cent had measurable hearing loss in left ear; 23.1 per cent showed some defect in vision; 17.2 per cent showed nutritional deficiencies; 15.3 per cent had defective speech; 13.7 per cent had been checked for cervical glands; 9.2 per cent were identified with mouth breathing; 8.4 per cent showed skin irritations; and 5.1 per cent showed thyroid deficiency.

Number of Orthopedic Cases

In the case of crippled children there has been less governmental help in determining the number than for the blind and the deaf in which the decennial census provided a listing since 1830. For orthopedic children, agencies and commissions have been active in enumerating the number of cases. In 1924 the New York State Commission made a survey and distributed the blanks for it on the basis of 2.5 children under eighteen years of age per 1000 of the general population. This estimate was found to be somewhat conservative, with 3.14 for the total of New York counties not including cities, and 4.90 when cities were included. In Broome County, New York, a very careful check was made including minor orthopedic defects and the ratio approximated 12 to 15 per 1000 of the general population. In 1930 a survey was made of two counties of Michigan involving a population of about 8000. Cardiac cases were included with other orthopedics, raising the total to 26 per 1000 of the general population.

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[1] L. Keller, *Hearing Survey in Detroit Schools*, Wayne University, Detroit, Master's essay, 1940, p. 3.

[2] J. J. Lee, *op. cit.*, pp. 236–238.

There is an increasing number of crippled children continuously being discovered by the more extensive list of agencies and individuals being on the alert for them. On December 31, 1946, the Crippled Children's Services of the United States Children's Bureau had listed 449,545 children under twenty-one years of age in the United States and its territories.[1]

Sex and age distribution. It has been noted in other types of handicaps that boys exceeded girls. In orthopedic children this preponderance is also true but to a lesser extent. The White House Conference report of 1930 noted from 4 to 6 per cent more boys than girls. Cleveland and New York State reported 55 per cent boys; Chicago, 53 per cent; New York City, 52.4 per cent. In the Oakman School in Detroit Lee's study of 835 children showed 54.8 per cent boys. Orthopedic defects occur at a very early age or may exist at birth. In a special study, in connection with the Philadelphia Hospital and Health Survey, 2.4 per 1000 of 14,420 babies examined had congenital defects of a type that would classify them as orthopedic cripples. In Chicago, 83 per cent of cripples under twenty-one years of age were crippled before the age of six years. In Wisconsin, 79 per cent were crippled before the age of seven. It is evident that most orthopedic defects occur early in life, and that early educational provision should be made for them.

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[1] Report of the Division of Statistical Research, Children's Bureau, Federal Security Agency, January 26, 1948.

Causes, Remedies, and Preventions

There are a few general causes of crippling which account for over half of all orthopedic cases, while a large number of miscellaneous cases account for a minority of cases, with a smaller miscellaneous set of causes resulting in a small number. The terminology used in different surveys is not always uniform, and practices vary as to admissions to schools for cripples. A few of the major causes will be discussed.

In Heck's[1] book there is a summary of causes on 9982 cases gathered from six different sources in various portions of the country.

It will be noted that infantile paralysis or poliomyelitis leads the list with 35.0 per cent of the total, with congenital

TABLE VIII

CAUSES OF ORTHOPEDIC DEFECTS

Causes	*Per cent*
Infantile paralysis (Poliomyelitis)	35.0
Spastic paralysis	3.2
Tuberculosis	9.6
Cardiac condition	1.3
Accidents	7.5
Congenital deformities	21.4
Acquired deformities	6.0
Miscellaneous	16.0
Total	100.0

TABLE IX

CAUSES OF ORTHOPEDIC DEFECTS

(Oakman School)

Causes	*Per cent*
Spastic paralysis	21.0
Cardiac conditions	16.9
Infantile paralysis (Poliomyelitis)	15.4
Surgical tuberculosis	7.3
Osteomyelitis	7.3
Nine less common causes	19.5
Sixty miscellaneous causes	12.6
Total	100.0

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[1] A. O. Heck, *The Education of Exceptional Children*, p. 144.

deformities second at 21.4 per cent, and tuberculosis third with 9.6 per cent.

In Lee's[1] investigation of the Oakman School in Detroit the distribution of cases is somewhat different. It is shown in Table IX.

Lee comments that his data are taken almost ten years later than the surveys reported by Heck which may indicate a general trend in new directions, or that there have been fewer epidemics of infantile paralysis in Detroit than in other portions of the country. It was ranked first in Heck's summaries but third in the Oakman School. Spastic paralysis moved from sixth place to first at Oakman; tuberculosis moved from third to fourth. There is need for a careful nation-wide survey of causes from time to time to note trends and as an approach to problems or causes which may be becoming more frequent.

Classification of crippling conditions. From the two Tables VIII and IX concerning causes of orthopedic defects, it is evident that some of the classifications are general and rather ambiguous. A more recent and improved classification has been proposed by Linck and others.[2] It is shown in Table X.

TABLE X

CLASSIFICATION OF CRIPPLING CONDITIONS

1. Crippling due to infection (e.g., bone and joint tuberculosis, osteomyelitis, poliomyelitis, rheumatoid arthritis, syphilis)
2. Cerebral palsy (spasticity, athetosis, ataxia, rigidity, tremors, or variations of these)
3. Crippling due to birth injury (e.g., Erb's palsy, bone fractures)
4. Cardiopathic conditions (e.g., congenital, acquired)
5. Congenital anomalies (e.g., congenital amputation, congenital dislocation, clubfoot, torticollis, spina bifida, cleft lip and palate)
6. Traumatic crippling (e.g., amputation, burns, fractures, joint contractures)
7. Tumors (e.g., bone tumors, bone cysts)
8. Developmental diseases (e.g., coxa plana, spinal osteochondritis)
9. Other conditions (e.g., fragile bones, spinal curvature, postural foot conditions, muscular atrophy, muscular dystrophy, rickets)

The classification listed in Table X discloses a great variety of crippling conditions which merits further elaboration.

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[1] J. J. Lee, *op. cit.*, p. 109.

[2] L. J. Linck, J. Shover, and E. E. Jacobs, "Teaching the Orthopedically Handicapped and the Cardiopathic," *Education of Exceptional Children*, National Society for the Study of Education, Forty-ninth Yearbook, Part II, The University of Chicago Press, 1950, pp. 196–197.

1. Crippling due to infection. Infections in the human body are of several types and they cause a variety of crippling defects. Tuberculosis of bones and joints is caused from infection by the germ tubercle bacillus which may affect any portion of the skeleton. The joints become enlarged and deformed so that the body loses its graceful symmetry. General weakness and loss of supple movements of the body are the end results. The structure of bones is affected so that deformity or defect occurs. In more extreme cases there is complete destruction of bones or portions of them.

Following quickly after injuries to bones, osteomyelitis may develop, but with no noticeable pain or evidence of it before an acute stage is reached and considerable damage has resulted. It should be a reasonable precaution that whenever any injury occurs to bones expert medical attention be given by an orthopedic surgeon so that osteomyelitis may not develop.

Infantile paralysis or poliomyelitis is caused by a virus which is contagious and often reaches epidemic proportions in the latter part of long, dry summers in the northern part of the country. The virus may be transmitted directly from person to person and sometimes by carriers who do not have the disease themselves. The infection spreads quickly to the spinal cord where it sets up an extreme inflammation, particularly in the anterior or front horns from which the nerves lead to various parts of the body. If cases are taken early, before the paralysis occurs and a suitable serum is administered, many cases can be prevented; but too often an advanced stage has been reached before the true nature of the illness has been diagnosed.

2. Cerebral palsy. Cerebral palsy is a disturbance of the motor functions due to damage to the brain, before, during, or after birth. These disturbances may affect many parts of the body either singly or in combination. A spastic condition affecting the tongue, vocal cords, and other organs of speech should properly be classified as cerebral palsy, although the end result is also defective speech. Because of their inaccurate movements, their relatively unintelligible speech, and often their unfavorable personal appearance, they are incorrectly believed to be feeble-minded. On the contrary, McIntire[1] found that fully two-thirds of a group of cerebral-palsied children should have been classified as normal in intelligence.

Athetosis is one of the forms of cerebral palsy in which nerve control of the fingers and sometimes of the toes is inadequate. The resulting involuntary movements are usually of a circular or rotary mction. Ataxia is another form of palsy characterized by inability to coordinate voluntary muscular movements of the body. A special form of ataxia is known as locomotor ataxia which is caused by syphilis and usually affects the gait, but may also cause disturbances in such sensations as vision. Other manifestations of palsy are tremors and rigidity occurring in various parts of the body.

3. Crippling due to birth injury. The process of birth is sometimes a very traumatic experience. The size of the child and the mother's anatomy do not always parallel one another. As a result birth is violent with injuries to both mother and child. Recently there have been very marked improvements in the technique of birth delivery with X rays of both mother and child before birth, so that the likelihood of injury may be lessened. In some instances the Caesarean operation provides delivery through the walls of the mother's abdomen and uterus rather than through the normal channels.

Whenever these modern methods are not in current practice, crippling may be caused from birth injury. One of these types of injury is Erb's Palsy in which there is paralysis affecting the arms and chest walls of the baby. A second type is bone fracture or breakage of immature and fragile bones. Wry or twisted neck may occur because of abnormal position of the head in birth delivery, but it may often be restored to its normal condition within a few days under proper medical care. Although great advances have been made in medical discovery and practice in recent years, there continues to be a large majority of births in private homes rather than in hospitals, particularly in rural areas. In like manner, there are many births without the attendance of any physician, either obstetrician or family doctor, and in other cases without the presence of a nurse or any other individual with special training.

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[1] J. T. McIntire, "The Incidence of Feeble-mindedness in the Cerebral-palsied," *American Journal of Mental Deficiency*, 1946, L, p. 494.

4. Cardiopathic conditions. Whereas many crippling conditions have some obvious, external symptoms, cardiopathic conditions are a notable exception. The heart is an internal organ whose malfunctioning is not visible, yet nevertheless, its crippling effects are known to be fully as serious as that of any other organ. Recently it has been realized that weaknesses of the heart muscles, and poor coordination of the valves of the heart which results in physical incapacity are in much the same category of orthopedic disabilities as are cerebral palsy, osteomyelitis, or poliomyelitis.

Cardiopathic conditions may be classified under two categories. The category is linked with the orthopedic group for two reasons: first, because of the crippling effects of heart impairment noted above; second, because of the need for transporting some of the more severe cases to school, it is administratively more efficient to take them to orthopedic schools along with other orthopedic types. In such schools, they usually have special classes set aside for their particular disability and are not necessarily required to mingle with the others. The second category of classification is with children of lowered vitality. This is a common practice when special transportation is not necessary. Both plans are used and with effective results whenever cardiac cases are carefully diagnosed as to type and gravity. The various classifications of cardiopathic conditions will be presented in Chapter XII on Lowered Vitality. Since 1900 heart disease has risen from fourth to first place among the causes of death in the United States.

5. Congenital anomalies. There are many kinds of physical anomalies which may occur in the process of growth of the fetus before birth, and when they are found present after birth, they are designated as "congenital" as the term suggests. Many are caused by defects in inherent biological combinations concurrently from both parents. Often the same defect may be traced through one family line for several generations. Anomalies may also occur when the fetus develops in some cramped and unusual position throughout the entire pregnancy.

Congenital amputation of a limb sometimes results in having only one arm or leg. Fingers or toes may be missing. There is also congenital dislocation of the hip or other joints which may be remedied by surgery. Cleft palate and harelip are frequently found but plastic surgery is now bringing about remarkable restorations. Torticollis is an affection of the neck caused by irregular contraction of the muscles and resulting in stiffneck and unusual poses of the head.

Among the group of congenital anomalies spina bifida is the most serious. The spinal column develops a cleft at the lower end so that the nerves controlling the lower portions of the body do not function properly. As a result, those who are afflicted are usually bedridden and have little or no control of bladder or bowels so that they require constant personal care and attention.

6. Traumatic crippling. There are many external conditions in our highly complex civilization which cause injury to individuals. Traffic accidents pile up a great number of injuries in addition to the rapidly mounting number of fatalities. Traffic accidents may affect any part of the body, and with varying degrees of severity, ranging up to complete disability. Such is the price which the modern world pays for speed.

Infection may get so far out of hand that amputation is necessary of one or more of the four limbs or portions of them. Burns of serious degree often result in great impairment of physical motion as well as the social rejection which ensues from unfortunate appearance. Broken bones are frequent by-products from the vigorous play of children, but under ordinary circumstances healing occurs in a comparatively brief time and with no residual effects. Sprains from falls or from abnormal postures in play or in lifting force the various joints such as shoulders, elbows, and wrists, and hips, knees, and ankles out of their normal positions. These contractures sometimes do not heal completely without permanent stiffness. Locomotion is affected and supple use of these members is greatly diminished.

7. **Tumors.** Tumors are abnormal masses with no physiological function, which produce excessive swelling and disruption of the normal life processes. Tumors may develop in bones as well as in other organs or bodily systems. Cysts are collections of morbid matter which gather in various natural cavities including those in bones. Sometimes these various infectious growths develop into malignancy and result in cancer.

8. **Various developmental diseases gradually affect the normal functioning of the skeletal system.** Coxa plana is the technical term for atrophy or wasting away of the femur or principal thigh bone. When such wasting occurs during the period of childhood growth, the femur develops into an abnormally shortened and thickened state so that walking and other bodily movements cannot follow the normal pattern. Spinal osteochondritis is an inflammation of both bone and cartilage affecting the normal growth of the spine.

9. **Lee listed a total of over seventy different causes of orthopedic handicaps.** Although many types of causes of orthopedic handicaps have been presented the list is not fully complete. Unusual postural foot conditions pull the general body balance out of line. Spinal curvature, poor motor coordination and muscular control, and general malnutrition may cause a variety of other orthopedic defects.

History of the Orthopedic

Through the centuries of history the crippled have had very checkered and generally unfortunate careers. Since their handicap was usually very obvious they were subjected to more scorn, contempt, and punishment than the deaf or those suffering from other less noticeable handicaps. Many of them were either put to cruel death as part of a religious rites or they were subjected to extreme cruelty and persecution. Although there are some instances here and there of protection, it was not until the eighteenth century that a more enlightened point of view began to develop.

During the nineteenth century the emphasis was chiefly on physical care. Several prominent surgeons devoted their time and attention to the prevention and remedy of crippled conditions. Among these were Duchenne in France, Stromeyer in Germany, John Little and Hugh Owen Thomas in England, and John Ball in America. The education of cripples came at a much later time, with the first class in London in 1899. In 1900 Chicago opened the first class in America; Detroit opened its first class in 1910. Although the program for the entire country has been expanded at a rapid rate in the past thirty years, as yet not more than one-fifth of the total number have special education.

There have been many famous characters who were crippled. Lord Byron's clubfoot drove him to such desperation that he became an expert swimmer, able to negotiate the Hellespont. Immanuel Kant had a sunken chest which drove him into seclusion where he wrote his famous philosophical works. Beethoven was afflicted with asthma, was practically deaf, had a pockmarked and snub-nosed face, yet was a great musician and composer. Charles Steinmetz was born a cripple but sought the quiet of a laboratory and became one of the greatest students of electricity. The crippled condition of President Franklin D. Roosevelt since 1921 has been well known, along with his uphill fight to reach the highest office in the land.

Particular individuals stand out as pioneers in promoting the welfare and advancement of many types of handicapped and exceptional children. Some of these have been physicians, some educators, and others public-spirited citizens. Early in the present century one of the last type came in the person of "Daddy" Allen who became interested in crippled children. Near his home in Elyria, Ohio, there was a wreck of interurban trolley cars loaded with children. His firsthand efforts to render aid made him realize the plight of crippled children not only for immediate care but for their long-time educational needs. He organized the International Society for Crippled Children which has been one of the most powerful and influential of organizations among all those interested in any type of the handicapped. Just recently its name was changed to the National Society for Crippled Children. Many states have since organized state societies for crippled children and every state has some type of organization for the crippled.

Some early attempts were made at legislation, authorizing the establishment of special classes or schools for crippled children. Massachusetts passed such laws in 1904 and Minnesota in 1907. In 1917 both Ohio and New York passed laws placing the responsibility for such classes upon local boards of education. In 1921 Ohio amended its law to provide for the state paying all excess costs over local expenses up to $300. At the present time about one-half of the states have legislation authorizing crippled classes, with twelve providing state aid.

The Social Security Law of 1935 laid particular emphasis upon medical, surgical, and aftercare service for the physical restoration and social readjustment of crippled children. The Division of Vocational Rehabilitation of the State Board of Control for Vocational Education operates under the United States Office of Education. Since 1920 it has operated jointly with the states to provide help and training for cripples and other types of physically handicapped above seventeen years of age.

Various fraternal and luncheon clubs have been very active in behalf of different types of the handicapped, particularly the crippled. The Elks, Shriners, American Legion, Junior League, Kiwanis, and Rotary have all participated in various ways. Rotary clubs have been especially active in New York, Ohio, and Michigan. All of these organizations create a popular interest among representative and influential citizens which is reflected in legislation and in more adequate financial support. Those who are interested in all types of exceptional children hope that the community support and club influence may be extended to include them, without detracting from the support and aid to the crippled.

Modern School Programs

Although there was a comparatively slow start in the education of orthopedic children, the movement has made very remarkable progress in a relatively short time. Several of the larger cities have built splendid school buildings and incorporated many unusual features including medical and therapeutic equipment so that complete educational and physical needs are provided. Among these buildings are the Sunbeam School in Cleveland, the Oakman School in Detroit, the Spalding School in Chicago. Whenever there are only a few hundred children the one-story plan is very practical: the children do not have to climb stairs and the ground space need not be too expansive. Whenever there are more than a thousand pupils a multistory building with elevators is more practical. Both types occur among the various schools.

The classrooms are somewhat larger than those for regular pupils and face the outside so that liberal window space is provided. The auditorium, gymnasiums, lunchroom, and playrooms often face the inside courts. The halls are wide and well-planned entrances permit the children to reach various parts of the building from the bus stops. At the ends of the halls large mirrors are sometimes mounted into the walls so that children may practice good gait and posture. Lockers for outer wraps are frequently placed in connection with classrooms so that teachers may help their own pupils when arriving and leaving.

The health and physiotherapy program are very important features of crippled schools. Cots for resting are provided in sunrooms with window glass of a special type so that the ultraviolet rays of the sun are able to penetrate. Rooms with special lights of various kinds for treatment are conveniently located near the examining room. There are also a room with equipment for making and changing plaster casts, and other features which remind one of a modern hospital laboratory. The therapy tank for cases of poliomyelitis is located conveniently near these other treatment rooms. There is also a regular type of swimming pool where the less handicapped may receive informal therapy.

After a visit to such a school upon the part of the public or by teachers of regular children there is a strong feeling that eventually many of the features of the crippled schools, in modified form, should also be available to all children. It is felt that if such a health program is able to restore many torn and twisted bodies to reasonably normal status, more emphasis upon a preventive program would raise the general health level of all children. These long-time influences are certain to have general effects upon all educational practices as well as upon the definite program for crippled children.

One can do no better, in closing this discussion, than to cite the recommendations which Lee [1] makes at the conclusion of his dissertation. They apply not only to the Oakman School but are probably of general applicability wherever schools for the crippled exist.

1. Evidence was not found to warrant reducing any of the existing policies, procedures, or services at the Oakman School. It appeared that the physical and educational needs of the children were being met effectively and well in so far as they were within the scope and responsibility of the school. The educational progress children had made was about as rapid as their mental and physical limitations would permit.
2. It appeared that some further gains could be created through extension of efforts and services in these directions:
    - (a) Public relations and parent education centered on prevention and on the imperative need for early and intensive medical treatment in early childhood to further prevent and reduce residual handicaps.
    - (b) Public relations and education among school officials and teachers, so crippled children would be referred and admitted to the orthopedic school more promptly.
    - (c) Intensification of the work of visiting teachers and social workers in the homes where economic levels were inadequate and where there was lack of cooperation; where homes were not cooperative; where homes were inadequate or lacking in motivation.
    - (d) Extension of the follow-up service and reporting on children after they had left the Oakman School. This follow-up service should include success of pupils in other schools to which they transferred; how long they continued in school; and how well their selection of life goals and their further preparation were integrated in relation to vocational preparation, employment and social adjustment.
    - (e) It appeared that, possibly, greater effort could profitably

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[1] J. J. Lee, *op. cit.*, pp. 275–277.

be centered on securing treatment of non-orthopedic physical conditions.

3. Further intensive research is needed with reference to the following:
    (a) The medical phases of the problems of crippling. It is desirable that medical specialists survey the accomplishments that are being created through physiotherapy and physical restoration.
    (b) The psychological characteristics and the mental health of crippled children constitute an area of urgently needed investigation. This area should provide a major challenge to clinical psychologists.
    (c) The vocational and social adjustment or adequacy of crippled children in later life and in social effectiveness constitute a third major area in which research is needed. From such an investigation would come a true evaluation of all of the earlier services that are being provided through medical training and through education and training.

QUESTIONS AND TOPICS FOR DISCUSSION

1. In the light of this chapter, describe the condition of any crippled person whom you have known.
2. Compare the many definitions of orthopedic conditions as to differences and similarities.
3. Describe the general conditions in which the majority of crippled children live, and interpret them with respect to these conditions.
4. Discuss some of the rather unusual causes and conditions of crippling as described in detail in the Report of the Michigan Crippled Children Commission Report of 1936, page 9.
5. Discuss reasons why the percentage of different causes varies in different parts of the country. Discuss the distribution of causes from other parts of the world.
6. Report on a more inclusive list of famous characters who were crippled and state some of their accomplishments.
7. Visit a crippled school and see all of the features, both educational and those for physical rehabilitation.
8. Report on the legal aid to local school systems from state sources throughout the country.

INSTITUTE OF EDUCATION FOR WOMEN
Dept. of Extension
SERVICE.
CALCUTTA-27

Chapter XI

DISORDERS OF PHYSICAL GROWTH

Long before the days of modern child psychology or knowledge about such handicaps as vision or hearing, certain impressions were gained about children and adults from their general physical stature. Such impressions are still very important and form the basis of much popular psychology today. The child in every classroom who towers head and shoulders above all the others of his own age always attracts attention. The one who weighs about twice as much as any of the others likewise comes under special scrutiny, while at the other extreme, children much smaller and thinner than the average also challenge curiosity. In view of these practical considerations it seems desirable to study physical stature and its consequences. Items of special interest are psychological characteristics, the nature of growth and development, and causes and remedies in unusual conditions.

Psychological Characteristics

The psychological characteristics and social maladjustments of such cases merit more attention than deviations in physical status. In order to gain a better understanding of these attitudes it is helpful to refer to ourselves as the norm and from there to advance gradually toward those who are extremely different.

Effects of being tall. The person who is slightly taller than average probably enjoys a certain feeling of physical superiority with a slight advantage in his favor. When an individual is extremely tall he often has feelings of inferiority because he does not belong to the normal, average group. If he makes an awkward move, it seems twice as awkward because he is twice as large. He finds low doors a constant source of danger, and dancing with very short girls is a social embarrassment. On the other hand if he is strong and well-proportioned, he is a great asset on athletic teams for his high school and university. He may qualify for some unique position in life where tallness is a definite requirement and under all of these favorable circumstances tallness is a psychological asset rather than a liability. Extreme tallness in girls offers similar problems with probably fewer opportunities to capitalize on it in athletics and other positions. As an antidote for possible social maladjustments, some colleges and student groups have formed Tip-Toppers Clubs in which the men must be well over six feet in height and the women over five feet, ten inches, to qualify for admission. Such clubs assist individuals to identify themselves with a group similar to themselves and hence develop means of being more generally acceptable. While there are many ways of compensating, a certain percentage of tall children and young people are maladjusted psychologically because of their tallness.

One of the most common characteristics of the tall child is that he is judged by his size rather than his age and more is expected of him on every hand than he is capable of giving. He is thought of as being an eight-year-old when he is actually six. The constant expectation and strain under which he lives tend to make him nervous and give him a vague feeling of injustice or that something is wrong which he does not understand. In case he is mentally advanced, he can often live up to the expectation from his unusual size and no problems arise from it. On the other hand, if he is mentally slow for his age and very slow for his size, his emotional and social problems are greatly increased. The problem becomes very complicated and as a result such children frequently develop into behavior problems.

Effects of being short. The effect of being short is similar to extreme tallness in that it tends to bring social isolation, with its attendant feelings of inferiority. Many adults who were short in childhood complain of having been teased a great deal. There are fewer opportunities to compensate by athletic prowess as in the case of tallness. Inferiority in physical stature is often erroneously assumed to be paralleled by shortcomings in desirable traits of personality and character, and hence the short person has to make unusual effort to show superiority in these important directions.

The short child is often assumed to be much younger than he actually is and hence not so much is expected of him as he is capable of giving. He senses a compromising attitude upon the part of older children and adults which is very disturbing and difficult to combat. At one extreme he may be mentally slow and socially immature so that he merely accepts the implication of being no older than his limited size would indicate. If he is very alert mentally, he rises to the occasion and proves his age conclusively in spite of his small size.

Effects of overweight and underweight. The overweight child is frequently clumsy and physically inactive. Many of them fall into certain patterns of personality on account of endocrine disturbances. They are teased by being called "Fatty," and they are often miserable in many ways. "Skinny" is a favorite nickname for the underweight child. His general lack of weight and his condition of underdevelopment offer many avenues to social ostracism. In Baker and Traphagen's[1] study of behavior-problem children there is a fairly close relationship between deviations of size and attitudes in the home toward such children.

Nature of Growth and Development

Standards of growth and development. Most of the research in the field of growth and development until recently has been in the direction of gross norms. While these standards had certain values they did not explain the real nature of growth in individual cases. They were derived from mass measurements of large numbers of children for height and weight and yielded a composite picture, which was supposed to represent the typical child from an early age into adulthood. In the evolution of experimentation such measurements were a natural first step, and they will always have certain values as points of reference.

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[1] H. J. Baker and V. Traphagen, *The Diagnosis and Treatment of Behavior-Problem Children*, The Macmillan Company, New York, 1935, p. 362.

Typical of such measurements were the height and weight tables by Baldwin and Wood for ages 5 to 18, inclusive, boys and girls separately, and with different weights corresponding to different heights for various ages. For example, girls 50 inches tall were expected to weigh 56 pounds if 6 or 7 years of age; 57, if 8 years; 58, if 9 years; 59, if 10 years; 61, if 11 years; and 62, if 12 years of age. Reading these tables according to age rather than height at 10 years of age, the weight ranges from 50 pounds at 47 inches of height to 91 pounds if 60 inches tall. It will be noted from the range of measurements at 10 years of age that considerable variability was to be found, with weights from 50 to 91 pounds and heights from 47 to 60 inches. Actually there are girls ten years of age who exceed these limits, both in weight and in height. As a result of these extensive and carefully prepared measurements some idea of the vast range in growth differences came to light.

There were probably some misconceptions about a too literal use and interpretation of these standards. It was sometimes assumed that a child's weight should fall exactly at the norm for his height at the particular age and that any deviation of a pound of more above or below was a cause of alarm. As a matter of fact there are large deviations from these standards in individual cases which are entirely within what should be considered a normal range. Many children were referred to their family physicians or to some public clinic for physical examination so as to discover abnormalities in growth. In many cases they were correctly reported as being entirely normal in development. Teachers had often noted various psychological and emotional reactions resulting from deviations from the average or standard of that age and assumed that some physiological adjustment should be made.

Individual or longitudinal standards. The mass, or composite, method of making standards was found to be a very imperfect fit for the growth of any individual child. At one age he might be above these norms and some time later might be below them. Individual children apparently did not grow at the steady, constant rate which would be assumed from the mass norms. This fact was discovered when research projects began the long task of measuring the same children year after year and noting the individual's variations. The Harvard Growth Study[1] measured 3500 children entering the first grade in three cities of the Boston metropolitan area in 1922, and annually repeated physical measurements were made on the same children for a period of twelve years. Jones[2] secured measurements of strength of grip of each hand, strength of pull, and strength of thrust by the use of a dynamometer on a group of 139 boys and girls at six-month intervals from eleven to seventeen and one-half years of age. He noted "that growth in strength may in itself be regarded as a puberal indicator and also as a secondary sexual characteristic."

General bodily growth. From the irregularity of the gross physical growth curves of individuals and from measurements of various portions of the body, it is evident that growth has many variables affecting it. Davenport[3] states that bodily growth comes from various internal stimuli which act at different times and on different organs. He developed various tables of stature and weight to support this theory of discontinuous growth. Scammon[4] and others mention four kinds of growth: general or skeletal, neural, lymphoid, and genital. In general growth there are three areas distinguished from one another: head and face, trunk, and extremities.

General standards or norms have been developed for the growth and eruption of the teeth with the first molar at six years, incisors at seven, the canine or cuspid at twelve, and the third molar at twenty-two years. Pryor[5] has made a framework of factors in development by periods, from one year of age through late adolescence, and he has traced the course of growth and body proportions, and motor and mental development throughout the entire range. A thoroughgoing report on child development has been made by Olson,[1] including growth patterns on many variables such as height, weight, dental, and reading age.

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[1] W. F. Dearborn and J. W. M. Rothney, *Predicting the Child's Development*, Sci-Art Publishers, Cambridge, Mass., 1941, 360 pp.

[2] H. E. Jones, *Motor Performance and Growth*, University of California Press, Berkeley, 1949, 181 pp.

[3] C. B. Davenport, "Human Metamorphosis," *American Journal of Physical Anthropology*, 1926, **9**, pp. 205–222.

[4] J. A. Harris, C. M. Jackson, D. G. Paterson, and R. E. Scammon, *The Measurement of Man*, University of Minnesota Press, Minneapolis, 1930, 215 pp.

[5] H. B. Pryor, *As the Child Grows*, Silver, Burdett Company, New York, 1943, 400 pp.

Types of body build. Kretschmer's attempts to relate types of body build to kinds of mental disease was a forerunner of Sheldon's [2] more successful classification of bodily types on a tri-polar set of dimensional components. In his plan the first component is endomorphy or the relative predominance of bodily structure in areas dealing with digestion and assimilation; the second component is mesomorphy or emphasis on bone, muscle, and connective tissue; and the third component with dominance of the skin and its appendages, including the nervous system. In Sheldon's classification, a rating of seven denotes an excessive predominance and a rating of one an excessive lack of the particular component. He observes that many individuals have two of the three components present to a considerable degree but the third one is often quite deficient. The typical individual would tend to have an average rating of four points on all three components. In his later publications Sheldon notes some parallels between body type and temperament, which throws new light upon the general nature of temperament and disposition.

Development of the bones. Adair and Scammon [3] took X rays of one hundred newborn infants and found a close relation existing between total body length and advancement of ossification, but with less relation to body weight. Pryor [4] reviewed the literature on X-ray research and noted that the more rapid ossification of the female may be applied to the determination of sex. Various investigators noted that rates of ossification were affected by thyroid deficiency, illness, and nutrition. Dearborn and Rothney [1] devised a system of measuring ossification by taking X-ray pictures of the right hand over a period of years in their study and found the rates of different individuals varying widely from each other. They note that any comparison with a composite norm is not very helpful in determining the rate of any individual's development.

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[1] W. C. Olson, *Child Development*, D. C. Heath and Company, Boston, 1949, 417 pp.

[2] W. H. Sheldon, S. S. Stevens, and W. B. Tucker, *The Varieties of Human Physique*, Harper and Brothers, New York, 1940, 347 pp.

[3] F. L. Adair and R. E. Scammon, "A Study of the Ossification Centers of the Wrist, Knee, and Ankle at Birth, with Particular Reference to the Physical Development and Maturity of the New Born," *American Journal of Obstetrics and Gynecology*, 1921, **2**, pp. 35–60.

[4] J. W. Pryor, "Roentgenographic Investigation of the Time Element in Ossification," *American Journal of Roentgenology and Radium Therapy*, 1933, **29**, pp. 798–804.

Race influences. As a race, Negroes are smaller than whites. Royster and Hulvey [2] measured about nine thousand Negro children in Richmond, Virginia, and found them shorter than whites in boys from six to eighteen years and from fifteen to eighteen years for girls. From the ages of five to eleven years, Lloyd-Jones [3] found whites to be the tallest and heaviest, Negroes next, then Mexicans, with the Japanese shortest and lightest. Any one who observes different racial groups in schools or neighborhoods is likely to note these general trends also.

Family influences. Palmer [4] prepared data on 193 pairs of brothers and 154 pairs of sisters during the age period from seven to twelve years at times when they had reached the same chronological age, since there were no twins in the study. The correlation between heights for both sexes combined was .44 and .33 for weight. These correlations do not show a very marked correspondence, with less for weight than for height. Brothers are more nearly alike than sisters, but both sexes tend to decrease in family correlation as they get older. Any one who has observed family pictures of grown children usually notes great differences in height and weight between and among them. It would appear that each individual tends to grow at a rate only slightly related to other members of the family. It is interesting to note that when a child of very large parents is only of average size little comment is made about it, but when a child of that family is very large also the explanation of the family heredity is used as the logical explanation.

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[1] Dearborn and Rothney, *op. cit.*, pp. 257–260.

[2] L. T. Royster and C. N. Hulvey, "The Relations of Weight, Height and Age in Negro Children," *American Journal of Diseases in Children*, 1929, **38**, pp. 1222-30.

[3] O. Lloyd-Jones, "Race and Stature; A Study of Los Angeles School Children," *Research Quarterly of the American Association for Health, Physical Education and Recreation*, 1941, **12**, pp. 83–97.

[4] C. E. Palmer, "Age Changes in the Physical Resemblances of Siblings," *Child Development*, 1934, **5**, pp. 351–360.

Other influences on growth. There have been a few studies of the relation between socioeconomic classes and growth, with balances in favor of the higher socioeconomic classes. However, there are many other factors of difference between the two classes than the simple and direct relation to this one factor. The Harvard Growth Studies showed that some years were better growth years than others. Palmer [1] noted that in Hagerstown, Maryland, the 1924–1925 year was an inferior "growing" year whereas 1926–1927 was a good "growing" year. In general, children born in California are taller than those born elsewhere as shown by measurements from six to eighteen years of age. Children grow more during vacations than during the school year which may be due to greater physical activity and better appetites resulting from it.

It may be noted from these studies that growth is conditioned by many factors both within and outside of the body. Growth is irregular as to parts of the body, and probably has many irregularities resulting from different conditions affecting different parts of the body.

There are two other important factors affecting growth. One of them is nutrition, and the second is the endocrine system or the ductless glands. Each of these will now be considered.

Malnutrition and Undernourishment

Malnutrition is a common cause of poor growth. Vitality is lowered after growth has taken place when malnutrition occurs. Whenever any one gives malnutrition a superficial thought the impression prevails that American children are generally well fed, happy, and in good physical condition in this land of plenty. Nothing is actually farther from the truth, for the White House Conference[1] estimated that there were 6,000,000 malnourished children in this country. This number is, by far, the largest group of all types of exceptional children. Malnourishment becomes one of the greatest challenges to child care, to proper education, and to hygienic and economic conditions.

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[1] C. E. Palmer, "Variations of Growth in Weight of Elementary School Children, 1921–1928," *U. S. Public Health Reports*, 1933, **48**, pp. 993–1005.

The tragic conditions of malnourishment and starvation which are afflicting millions of innocent children and adults throughout the world make it a problem of first importance in the present discussion.

Types and Causes

One of the most common causes of malnutrition is *hookworm.*[2] It is a parasitic disease which is especially prevalent in tropical and southern countries in which there is heavy rainfall. The International Health Board made a survey in Alabama in 1925 and found hookworm among children of school age ranging from less than 5 per cent in larger towns to 95 per cent in some of the heavily infested rural communities. Children were the group most commonly infected. The hookworm enters the body in larvae form through the bare feet and eventually reaches the intestines where it lays its eggs and where worms are produced. Severe cases with more than five hundred worms become undernourished, stunted in growth, anemic, suffer from headaches, and are much underweight. Negroes have much less infection than whites in the South.

Hook

Ascariasis is a second important parasite disease in the South. It also comes from the soil, with its eggs hatched in the intestines. They are then carried to the lungs in the blood and cause severe hemorrhage. Ascariasis is very common in some areas, affecting up to 60 per cent of the children. Early detection is very important so as to prevent anemia. For this disease as well as for hookworm, the improvement of sanitation and personal hygiene are very important. Training young children

asca

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[1] White House Conference, *Special Education: The Handicapped and the Gifted,* p. 6.

[2] White House Conference, *The Handicapped: Prevention, Maintenance, Protection,* p. 250.

in the use of sanitary practices is very essential because children are commonly infected. Some very hopeful progress has been made in these matters throughout the South in the past few years. In North Carolina hookworm is quite well under control.

Malaria is also an important cause of maldevelopment. Texas placed it first among the causes of malnutrition at the time of the White House Conference.

Lack of food or food with good nutritive value are causes of malnourishment. In other cases there is faulty assimilation of food and no matter how good the quality may be or how plentiful, the body does not get sufficient nourishment. In a converse manner, some children seem to thrive on very little food or food with low nutritive value. There are also cases in which emotional disturbances have gradually grown up and been centered around eating so that every mealtime becomes a crisis, either over the food itself or about other issues, which may be convenient topics of conversation when the family is assembled. It is sometimes difficult to determine whether emotional upset causes nutritional disturbance; or, on account of nutritional disturbance, emotional difficulties have developed.

Each type of case needs to be diagnosed upon its own merits and suitable programs of correction instituted. Many malnourished children are lacking in strength and vitality so that they cannot participate in the regular activities of the school with normal children. If they attempt to keep up, they do so at a great cost of energy and with further injury to themselves.

In many larger cities the malnourished are placed in classes for lowered vitality with the cardiac, with those who have recovered from tuberculosis, or with those who may have been subject to infection. There should be a great flexibility of program, with enrollment in such classes only until recovery is evident. Medical diagnosis and recommendation should always be made.

The Endocrine Glands

Among the causes of disorders and deviations in growth are the endocrine glands. This topic has captured the popular imagination in the past few years, entirely out of proportion to the frequency of actual glandular disturbances or to the possibilities of treatment. The medical specialists in endocrinology have found it difficult to exercise the amount of caution which they desire when overzealous and misinformed patients have insisted on endocrine treatment. This situation is roughly parallel to the popular interest in the I.Q., always evaluated upon a much more conservative basis by psychologists.

In the present discussion a few of the more important glands will be described, with disturbances in their functions and effects of such malfunctioning upon the human body. Some mention will be made of psychological and emotional effects, although these might more properly be reserved for a later chapter on the causes of behavior disorders.

The thyroid gland. The thyroid gland is a small body located at the base of the neck, usually weighing less than an ounce in the normal adult. When it increases to an unusual size so that it gives a bulging appearance to the neck the condition is known as goiter. The chief function of the thyroid gland is to control the general metabolism of the body,—the process of building up or tearing down the living protoplasm. It may be readily seen that the thyroid gland has a very important function since it is closely related to growth.

There are several varieties of disturbance with different effects, including lack of sufficient function, excess function, and different effects according to the age of the child or person affected. The condition of overactivity of the thyroid gland is known as hyperthyroidism, resulting in greatly increased restlessness and overactivity. It is often accompanied by some loss of weight and irritability.

hyper-
thyroid

It is when the thyroid gland is lacking in its secretions that more noticeable disturbances are to be found. There are several types, results depending upon age, chiefly before and after adolescence. Before adolescence two types of hypothyroid or deficiency are noted. The first is the *Forme Fruste* type of thyroid deficiency in which children become tall for their age with long extremities and slender body proportions. This

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condition may be reduced by extra feedings between meals and additional rest, a program which should be undertaken by physician's prescription only. Such cases frequently show much restlessness and very poor behavior, both of which may be due to excessive fatigue rather than to the thyroid deficiency itself.

② The second form of thyroid deficiency in children results in a bodily type quite opposite to the first and is known as cretinoid thyroid deficiency. Such children are short, have short arms and legs, square body proportions, and short stubby fingers. They are slow and sluggish in behavior as well as in mental response. Many of them are classed as mentally subnormal and become candidates for special classes of that type. They may sit quietly in regular classes and cause no disturbance but get practically no benefit.

In adolescence two types of disturbance also develop. The one type is more frequent in girls who put on weight with ① excessive rapidity. They slow up mentally and curb their emotional interests. The second type is quite opposite with ② excessive restlessness, great fatigue, and an imperviousness to disciplinary measures. Many of these four types may be remedied by proper thyroid treatment, and as a general policy the earlier in life such conditions are discovered and treated the better are the chances for recovery.

The pituitary gland. The pituitary gland is located in a small, bony socket in the center of the skull. It is one of the best covered and protected organs of the body, which may indicate that nature considers it very important. Its function is also related to the operation of the other endocrine glands so that they all operate more or less as a unit. When one gland is deficient the others may operate to excess to compensate for it, so that the medical diagnosis and treatment are not simple and isolated procedures.

When the anterior lobe of the pituitary gland functions excessively in childhood, the individuals grow to unusual sizes and heights with a condition known as *gigantism.* It is a matter of misunderstanding and subtle irony that parents believe there is nothing wrong since these children are large and seemingly robust, reflecting good ancestry and care. If this disturbance occurs after adolescence when growth has been practically completed, growth begins again but in the hard way. It affects the hands, feet, and portions of the face and may become very painful. The nose becomes larger, the jaws expand so that the teeth become spaced wider than before, and the tongue is out of proportion. The psychological and emotional effects of such a condition are very grave. Most people have seen such persons at some time or other and were rather baffled by their peculiar appearance and behavior. This condition is known as acromegaly.

acromegal

When the anterior lobe of the pituitary is deficient in function the opposite condition of dwarfism tends to develop. The "midget" is small in all bodily proportions and has a rather delicate and graceful figure. When the posterior lobe of the pituitary functions deficiently there is retarded sexual development. Boys so affected become much overweight and their bodies develop in general proportions more along feminine than masculine lines. These boys are afraid to play with children of their own age or size and constantly compensate by teasing and tormenting smaller children. They have feelings of inadequacy and tend to lose all interest in schoolwork. Girls are also affected by the same condition to which they react by becoming extremely emotional. Long medical treatment is indicated. This type of sexual underdevelopment with its personality and psychological patterns is known as Froelich's syndrome.

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Other glands. There are several other glands, some of whose functions are not too well known, although many theories have been proposed. The parathyroids are four little bodies which lie near, or are embedded in the thyroid tissue. Their function is related to general control of the nervous system, because when they are not operating successfully, contractions of the muscles and convulsions may appear. The thymus gland is located in the region of the upper chest, reaches its maximum growth at about two years of age, and by the time of adolescence has atrophied or practically disappeared. Its function acts as a check upon the sexual develop-

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ment until the human body more nearly reaches its full physical development, which is a relatively long period. Cases of premature sexual development are usually associated with a very early atrophy of the thymus gland. The Pineal gland, located in the skull near the pituitary, seems to be related to the operation of the thymus in the control of sexual development. The adrenal glands are located just above the kidneys. Together with the pancreatic glands, in the same general region, they influence the course of digestion, the release of sugar into the blood, and excess sugar in the urine resulting in sugar diabetes. The sexual glands also have endocrine functions and when these are lacking, infantile characteristics tend to be continued beyond the childhood years.

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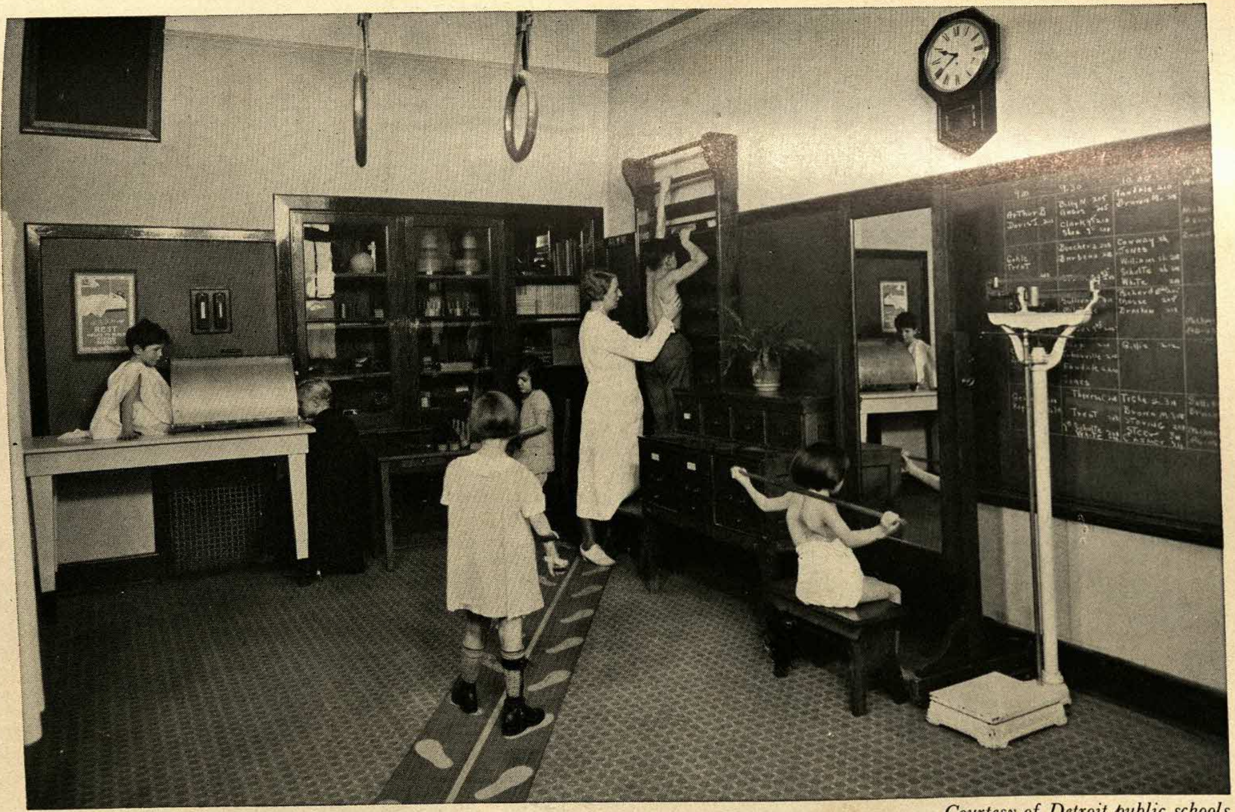
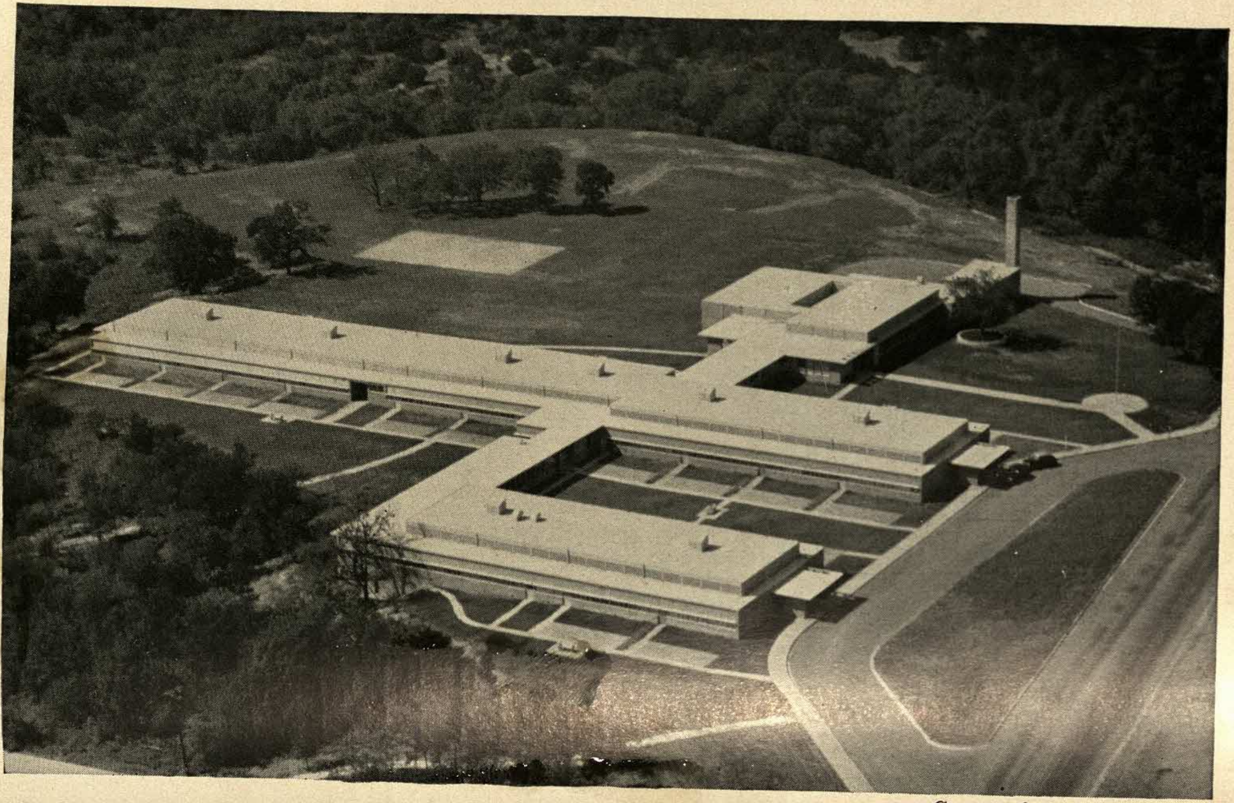
The endocrine glands have very important functions to perform in regulating the growth of the body and in governing the tempo of the vital processes throughout life. The amount of change which may be brought about by medical treatment is usually gauged on a conservative basis since treatment of one gland may bring about disturbance or malfunctioning upon the part of others. It is generally against the ethics of the medical profession to engage in wholesale and extreme experimentation upon human beings to learn the full possibilities of glandular treatment, and only in rather marked cases is treatment for growth disturbances generally advocated.

Glandular types do not have special classes designed primarily for them. Many cases of poor growth or malnutrition are probably to be found in classes of lowered vitality. In most cases the educational adjustments are made in regular grades but not always on a satisfactory basis. Although there seems to be little medical reason for isolating glandular cases in special classes, in view of the psychological and social maladjustments which they show, such classes might be very desirable. The only way to prove such a point would be actual trial of children in a class matched by a control group with similar difficulties allowed to remain in regular grades. The results from the psychological and social as well as the medical points of view should be the deciding factor in special class versus regular grade policy.



Courtesy of Detroit public schools

Physiotherapy exercises in the Oakman School for Cripples, Detroit public schools.



Courtesy of Austin public schools

The new Casis Elementary School in Austin, Texas.
One entire wing is reserved for handicapped and exceptional children.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Describe various cases which you have known of unusual height or weight or both.
2. Would you prefer being extremely tall or extremely short if you had to select one? Give your reasons.
3. Explain the difference between mass or composite standards and individual or longitudinal standards, with advantages and disadvantages of each.
4. Make a list of characteristics of races or nationalities with respect to physical characteristics.
5. Report on vitamins and calories as determiners of nutritional processes and results.
6. Visit a gland clinic and have a demonstration of cases, and explanation of treatment and diagnostic procedures.

Chapter XII

LOWERED VITALITY

Lowered vitality characterizes an important group of exceptional children. There has been a tendency to use the very unacceptable term "delicate" in describing these children; that of "lowered vitality" is generally more acceptable. Even the term "lowered" does not completely describe them, since there is hope that such conditions are temporary and "lowered" might imply permanency. Some term implying "convalescence" would be preferable although it never seems to be advocated, except in certain types of homes or hospitals.

In the present chapter there is a discussion of tuberculosis in children and also of cardiac cases. In the classes for children of lowered vitality, cases of chronic malnutrition are also usually included and this is to be recommended. Malnutrition has been discussed in the preceding chapter on disorders of physical growth and development along with other factors which affect growth.

I. TUBERCULOSIS

Tuberculosis has always been one of the most devastating diseases of mankind. Throughout most of the world where poverty rules, even today, tuberculosis continues to be as rampant as ever. Although its ravaging effects seem somewhat less terrifying than the "Black Death" of the Middle Ages, and although its toll is considerably less, it continues to rank high among the great scourges of mankind.

The Nature of Tuberculosis

Tuberculosis is an infectious disease caused by the tubercle bacillus. It may affect any tissues of the body but more commonly attacks the lungs. Tuberculosis is a very insidious disease which seems to permeate into all communities, large or small, but having more extreme and serious consequences in the lower economic areas. It is believed that fully one-half or more of all people even in civilized countries have some degree of infection prior to adulthood. The great majority of them build up an immunity which prevents the development of its more serious consequences. Frequently X-ray examinations of the chest in adolescence and in adulthood disclose scars on the lungs from hitherto undiscovered childhood tuberculosis. Many adults react positively to the tuberculin test which indicates that at some earlier time they had experienced an attack of active tuberculosis.

There are two types of pulmonary tuberculosis common in the United States, the *childhood type* and the *adult type*. Infection usually comes from contact with an infected person. Occasionally milk is the indirect source. The childhood type, as defined by the American Sanatorium Association[1] in 1929, "applies to tuberculosis disease resulting from first infection in the lung and associated tracheobronchial lymph nodes with tubercle bacilli regardless of the age in life when it develops." The lungs and that part of the lymphatic system draining them are the most common seats of infection.

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The adult type "is the result of continued infection or a reinfection from an exogenous or endogenous source; that is, it never develops except in the presence of a previous infection with tubercle bacilli which has resulted in some immunity."

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type

Psychological Characteristics

The emotional phases which accompany the tuberculosis cycle are worthy of study. There may be, first of all, the usual emotional tone of an individual who believes he is well, or at least in fair health. Suddenly he may find himself in a hospital or ill with this disease in an advanced stage. He finds the outlook frightening and uncertain. There has been a great amount of popular alarm about the fatal results of tuberculosis which should be modified in view of recent advances in its treatment and cure. At length the patient may learn that he is going to recover; knowledge which suddenly places him back upon his earlier emotional level and outlook on life. This cycle is quite different from that of the child who is born blind or crippled and who must adjust to spending his entire life in that condition.

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[1] White House Conference, *The Handicapped Child, Prevention, Maintenance, Protection*, p. 198.

In the period of active tuberculosis when physical movement is largely limited, emotional episodes occur which are difficult to treat satisfactorily. Eyre[1] quotes Cannon to the effect that when emotions occur the individual is ready to act to release tensions. On account of illness and physical incapacity the tuberculous patient may have emotional disturbances, but he is unable to engage in physical activity as an outlet. Emotion devastates his organism to a much greater degree than in a healthy and mobile individual. It is desirable to find other avenues or alternatives for the release of emotions in tuberculosis patients.

Muhl[2] showed that the so-called optimism of tuberculous patients was mostly a myth after studying irritability, suggestibility, and day-dreaming in a group of thirty girl and women patients. Strecker, Braceland, and Gordon[3] interviewed seventy-five tuberculous patients and found that thirty-five were somewhat fatalistic but making the best of it, twenty-nine were depressed, four had marked swings of moods, and seven were happy with a sense of well-being. There is usually much financial worry not only with regard to recovery, but about employment afterward.

In the cases of tuberculosis children, the types of psychological reaction depend, to a great extent, upon the attitudes and treatment which they receive from adults, according to reports by Kramer[1] and Banister.[2] Reactions common to other types of physical disabilities, such as severe orthopedic handicaps in which physical activities must be drastically reduced or completely curtailed, are also characteristic of tuberculous children. Lack of physical play curtails emotional outlets, while adult overprotection and excessive parental solicitude create emotional problems which are not caused directly by the disease, but are important even though accidental by-products.

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[1] M. B. Eyre, "The Role of Emotion in Tuberculosis," *American Review of Tuberculosis*, 1933, **27**, pp. 315–329.

[2] A. M. Muhl, "Fundamental Personality Trends in Tuberculous Women," *Psychoanalytic Review*, 1935, **10**, pp. 380–430.

[3] E. A. Strecker, F. J. Braceland, and B. Gordon, "Mental Attitudes of Tuberculous Patients," *Mental Hygiene*, 1938, **22**, pp. 529–543.

There are a few inconclusive reports about intelligence testing of tuberculous patients. There is little or no relationship between intelligence and degree of tuberculosis; this might logically be expected since the illness is a temporary condition which may strike into any group or any individual depending upon the chances of contagion. The emotional factors seem to be of greater significance.

The Number of Cases

The number of children who show some positive reactions to tuberculin tests is very high, with 28 per cent of children below high-school age, according to Chadwick and McPhedran.[3] The potential number is much greater than the actual number since in the White House Conference reports of 1930 there were 375,000 children with tuberculosis of the childhood type, 850,000 were suspicious cases, and 7812 had the adult type of tuberculosis. In the year 1900 tuberculosis ranked as the second cause of death in the United States and hence became the subject of intensive medical study. It has been reduced to sixth in rank as the cause of death, but in the more backward areas of countries in Central and South America it continues to rank high in the casualty list. In Santiago, Chile, the death rate per 100,000 is 430 or approximately ten times as great as in most cities in the northern part of the United States.

[1] H. C. Kramer, "Psychopathology of Childhood Tuberculosis," *Nervous Child*, **7**, 1948, pp. 102–114.

[2] H. Banister, "Psychology and the Tuberculous," *Journal of State Medicine*, **39**, 1931, pp. 267–274.

[3] H. D. Chadwick and F. M. McPhedran, *Childhood Type of Tuberculosis*, National Tuberculosis Association, New York, 1930, pp. 3–28.

Classification and Definitions

Contrary to popular opinion children in open-air classes of public schools do not have active tuberculosis. There are three types of children for whom a special educational program is desirable. The first includes those who have been active cases of tuberculosis but who have recovered from their acute condition so that they are no longer in danger of exposing others. They may be in need of added rest, nourishing food, carefully supervised activities, and continual inspection, lest the active condition may return.

2) The second type is represented by the child who had been in contact with tuberculosis in his home or elsewhere and may have developed into an active case himself. Through the health program of the open-air class, it is possible to build up resistance so that tuberculosis does not occur. 3) The third type of child with active tuberculosis is not a suitable candidate for an open-air class, but should be assigned to a hospital or sanatorium for treatment. While he is a patient, and within certain limits depending upon his general condition, some school facilities are often provided at the hospital or sanatorium. These cases of the third type range from those who are nearly recovered and will soon return to their homes to those who were discovered in already advanced stages or whose bodily resistance is so poor that hope of final recovery is very slight. Those of the third type who recover are often reassigned to the first type and receive further aid in making a complete restoration.

For a more hopeful outlook there is constant need for information and education to combat erroneous ideas about tuberculosis. Full advantage should be taken of medical treatment and of educational facilities which modern school systems offer.

Diagnosis

In the early days of the study of tuberculosis it was believed that an underweight condition was a certain sign of the disease. Children were weighed and measured for height and those falling about 15 per cent or more below the expected weight for height were considered as potential cases, or cases of chronic malnutrition. Studies have shown that there is little relationship between weight and tuberculosis. One-third of the children in one survey with pulmonary tuberculosis were not underweight, and fully one-fifth of the children in the contact group were normal in weight or actually overweight. Studies in height and weight have some very useful purposes in studies of growth, but they are not a safe nor accurate guide to tuberculosis.

The reason for this lack of relationship to height and weight lies in the fact that tuberculosis is a disease from the germ tubercle bacillus. It enters the body by contact or by close association with those who are infected or from the milk of tubercular cows. Obviously it may affect any one regardless of being thin, normal in size, or overweight. As noted earlier, it often affects the lungs and that part of the lymphatic system which drains them.

Tuberculin tests are advised in all cases. The Pirquet cutaneous test is commonly used; a positive reaction always means the presence of infection although it does not necessarily indicate whether the disease is latent or active. The Mantoux or intracutaneous test is more accurate with a larger number of reactors.

X-ray test yielding roentgenograms of the child's chest are indispensable since it is the only method by which the position and extent of latent tuberculosis lesions can be determined. This second method of diagnosis is being used quite widely and in many places of employment where physical examinations are required of candidates the X-ray picture of the chest is one of the essential features.

There are certain other symptoms which may supplement the physical examinations just noted. One of the most important is history of exposure from living with someone or working close beside someone who has tuberculosis in active form. Undue fatigue is another important symptom, low-grade fever, frequent colds, bronchitis, influenza, and poor condition of the cervical glands are factors in securing a thorough picture of both active or of latent tuberculosis.

It will be noted that the diagnosis of tuberculosis is a medical matter and final examination and diagnosis should always rest with the physician. However, it is important for teachers and parents to be familiar with the nature of the disease, with the course of its treatment, and its relationship to the education of tuberculous children.

It was believed in earlier days that there was a *pre*tubercular stage in children, but this is no more true than that there is a prestage for measles or any other disease. It is a germ disease and there is no preliminary stage before it makes its attack, according to Strachan [1] and other authorities.

Causes, Remedies, and Preventions

The causes of tuberculosis have been presented in the discussion of diagnosis, namely, infection from the germ tubercle bacillus. These causes are of an area or topographical nature, affecting certain portions of the human body, centering mainly in the lungs. In some instances the bones are affected so that crippled conditions develop such as were noted in Chap. X. There are other indirect causes which might properly be termed *etiological*, as per the classification of causes for blindness. These causes relate to the sources of infection such as from the milk of tubercular cows, or from living in close proximity with parents or others who have active pulmonary tuberculosis.

Treatment of tuberculosis is imperative in spite of the fact that in some cases the disease has been undiscovered and the patients healed completely without it. The presence of lesions on the X-ray pictures of many children give mute evidence on how often this disease has gone unnoticed. However, that fact is no excuse for not giving treatment wherever the disease is known to exist.

In cases where infants are born in a family known to have active tuberculosis the child should be removed from such contact as soon as possible. In case a child has been infected, care should be taken to remove further sources of exposure.

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[1] L. Strachan, "Research on Children with Low Vitality," *Journal of Exceptional Children*, extra issue, January, 1938, pp. 25–27.

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A second general type of treatment is to provide restricted activity, proper food, and hygienic surroundings, including plenty of fresh air and sunlight. Whenever there have been recent inflammatory processes the child should be kept in bed, and very restricted schedules of activity are necessary until all fevers have subsided. Much of the success of any therapy depends upon how early in the process disease is detected, and how thoroughly and how long treatments are carried on. Quite often cases are in very advanced stages before the true nature of the disease is known, and the chances of successful treatment are less favorable.

History of Tuberculosis

Throughout the ages tuberculosis has been known and recognized, although its cause was long unknown. Hippocrates (460–370 B.C.) wrote a very clear and almost modern description of lung tuberculosis under the name of "phthisis" by which the disease was known in early times. Galen (131–201 A.D.), a Greek experimental physiologist, also described the symptoms and advised a full milk diet and living in dry places at a high elevation. Louis (1787–1872) published a report of phthisis based on 358 dissections and 1960 clinical cases which showed the seat of the disease frequently in the apex of the lung.

Two inventions of medical apparatus assisted in the solution of disorders of the lungs as well as other parts of the body. The first was the stethoscope invented in 1819 by Leannec, who was an early victim of tuberculosis; the second was the discovery of X rays in 1895 by Roentgen. Robert Koch discovered the tubercle bacillus in 1882, and others soon found that it could be transmitted by inoculation from man to the lower animals. One of the unsuccessful experiments was the isolation of several cases in some stone cabins about 5 miles underground in the Mammoth Cave where dampness and cool, even temperatures in the fifties were hoped to be beneficial, but proved otherwise.

Open-air treatments in sanatoriums were started nearly two hundred years ago and have steadily grown to the present day. The first school of an open-air type was started at Charlottenburg, Germany, in 1904. It was located in a woods near Berlin and was designed for children who had lung trouble, heart disease, anemia, and scrofula. They were not ill enough to be kept home from regular school, but were too ill to carry a full school program. This school was quite complete, with physicians and nurses in attendance, and a school and health program running until early evening, seven days per week. Its success soon became known and many similar schools were opened throughout Germany. England opened its first school in 1907, and in America the first open-air school was started at Providence, Rhode Island, in January, 1908.[1] Detroit started its first unit in 1912.

There was a first international congress for tuberculosis held in Paris in 1888. The Christmas-seal campaign was started from the suggestion of a postal clerk in Denmark in 1903, using a nonpostage stamp of hope for letters and parcels. The idea was introduced into the United States by Jacob Riis, and by 1920 it was taken over on a country-wide basis by the National Tuberculosis Association. In 1936 the sales amounted to $83,000,000 and were sufficient to support the association, its two thousand affiliated organizations, about one thousand clinics, twelve hundred preventoriums for children, and about one-half of the twenty thousand public health nurses who give all or part time to tuberculosis patients.

On account of the possibility of anyone being exposed to tuberculosis from unknown contacts there is a great amount of popular sympathy for those who have unwittingly been the victims of similar conditions. This interest has undoubtedly aided in a vast program of remedy and prevention.

Current Problems in Teaching

The movement for special schools and classes for children who have been exposed to tuberculosis, or who are recovering from the active phases of the disease, has been under way in this country for about thirty years. Many special schools have been built which serve these groups, as well as cardiac cases and malnourished children. The program in these schools follows the regular curriculum as far as possible but with major emphasis always upon health. Additional food is frequently provided, including a nutritious lunch; rest is provided after lunch, with plenty of fresh air.

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[1] M. E. Frampton and H. G. Rowell, *Education of the Handicapped, Vol. I, History*, pp. 154–161.

There has been some tendency, particularly upon the part of the medical profession and health authorities, to reduce the number of such facilities in the past few years. This movement is based in part upon a hopeful reduction in the number of cases exposed to tuberculosis or recovering from it. It is also based on the general idea that if all regular schools would provide an intensive health plan for all children, the special school of this type would not be needed. While there may be a few isolated instances where such ideal conditions exist, they are by no means typical of the schools of the country as a whole and will not be for many years to come.

There is another somewhat more plausible idea that the less severe cases might attend regular school certain hours of the day but report for special nutrition and rest periods to a room in the same building manned by a teacher who had specialized in such cases. In this manner the child would not be segregated from his regular classmates and would gain certain mentally hygienic and emotional values which might otherwise be denied him in a plan of complete segregation. This type of organization would be somewhat similar to that of the class for speech defectives.

The chief aim of any type of class or plan of instruction is to get the maximum health benefits with reasonable costs, and with least disturbance to the normal life and social adjustment of pupils. Experimental evidence from many sources and practical administrative considerations should eventually solve this problem.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Describe a case of active tuberculosis that you have known.
2. What steps does your community take to avoid tuberculosis?
3. How much tuberculosis is there in your community?

4. Describe more fully the various types of tuberculin tests.
5. Visit a class for lowered vitality and have the various types explained.
6. Visit a children's ward of a tuberculosis sanatorium and have a demonstration of cases.

II. CARDIAC DEFECTS

Cardiac or heart disease is an internal condition and hence seems a little obscure and removed from the field of obvious defects and disorders. However, it is no more obscure than tuberculosis, or than some types of hearing or vision defects, or feeble-mindedness. One of the important requirements and qualifications of those who wish to study and teach exceptional children is that they be as much informed about and interested in internal as in external conditions.

There has been some discussion in recent years about where to house cardiacs. They lie between the group of lowered vitality and the orthopedic children. In the early days cardiacs were generally housed with those of lowered vitality. Many continue to be placed with them today. Some are located in orthopedic schools because their conditions are so extreme that they must be transported to school. Since the crippled are the only other large group which usually gets such transportation, it is convenient from a practical point of view to take them to orthopedic schools. Furthermore, they have been defined as orthopedic cases in some instances with the interpretation that the cardiac muscles are crippled. In the discussion of crippled children in Chap. X some mention has been made of them, but they are such an important group that they merit further discussion in this chapter. It may be entirely immaterial where they are placed in an educational classification since the main issue is that they should be recognized, treated, and educated under optimum conditions.

Definitions

There do not seem to be any formal definitions of heart disease, similar to, or as definite as that for blindness or deafness. In general, it is an impairment of the heart below that of the normal or average condition. It may vary in degree from a very slight defect or deviation to an extreme condition which requires quiet and no physical exertion. A little later, a classification will be given of the various degrees of impairment.

There is a great amount of popular confusion and concern over heart trouble, mixed with many erroneous ideas. Some cases represent a disabling disease in which the condition may be very ominous, but many other cases are a handicapped condition rather than a disease. Such condition might be similar to having a slightly crippled hand with one finger gone in contrast to a hand so withered as to be of no practical use.

There are many people with heart ailments who are not aware of them, which is also true of other defects. There is a danger that such persons may bring on permanent damage and injury when they are not aware of what their physical limitations are. There are other cases of persons with no heart disease or defect who are firmly convinced that they have a very bad heart condition and no amount of examinations by the most eminent cardiologists convinces them to the contrary.

Psychological Characteristics

One type of psychological characteristic has just been indicated of individuals with no heart defect at all who believe they are badly afflicted. They live in great emotional tension which is actually of no potential value except as alibis for lack of effort and exertion. This problem is one of no intimate or practical concern for those who deal with bona fide cardiac conditions, except that they might refer them to clinics for psychological and psychiatric study.

Studies of the emotional characteristics of cardiac cases are somewhat meager in number and findings. Cases of severe disability, in which all physical activity must be restricted, probably suffer from much the same kind of emotional blockings as are characteristic of active and advanced cases of pulmonary tuberculosis. It is difficult for them to drain off their emotional tensions because they cannot use the traditional device of the nonhandicapped, namely, increased physical activity as a practical outlet. In extreme cases, fear of imminent death at a premature age tends to create problems of great emotional importance.

For those whose activities are restricted as to ordinary play and active association with children of the same age, emotional blockings and frustrations are obviously an important feature of emotional life. They find it necessary to set up compensations in terms of activities of a sedentary nature, reading, stamp collecting, and similar projects which tend to isolate them from their normal associates. Their plight may be more severe than that of an orthopedic case in which the child with an amputated leg as well as his associates have visible and tangible evidence why his physical activities are restricted.

Sigel[1] reports on a psychiatric study of thirty-one cardiac patients to the effect that there is almost perfect correlation between the degree of cardiac difficulty and the presence of mental-hygiene problems. The majority of those with cardiac difficulty do not complain of subjective symptoms, while those who do complain usually have emotional problems. Foster reports that both children and adults may use their physical handicap as an excuse for abandoning any competitive endeavor. As a result, they disclose personality features that have been previously dormant and concealed.

Ross tested twenty-two children between the ages of five and fourteen having severe organic heart disease with the Binet test and found only 18 per cent in the normal range of I.Q.'s from 90 to 110; the great majority were below that level, ranging down to feeble-minded I.Q.'s of 50. This group was probably characterized by multiple physical and mental defects. The Halsey Committee[2] in New York City has stressed the fact that cardiac children have the same average intelligence as normals. It was claimed, further, that their educational achievement was excellent. This may be due to the fact that they were restricted in physical activity and hence devoted more than the usual time to study.

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[1] E. Sigel, "The Mental Hygiene Problems of Cardiac Patients," *Smith College Studies in Social Work*, 1932, **2**, pp. 336–357.

[2] M. E. Frampton and H. G. Rowell, *Education of the Handicapped, II, Problems*, p. 304.

Number of Cases

After summarizing several partial surveys in a few areas of the United States, the White House Conference estimated that from 5 to 15 per cent of school children fell among the five functional cardiac classifications proposed by the American Heart Association. Several hundred thousand children have heart disease from rheumatic fever. One per cent may have heart disease so extreme as to need supervision, periodic examination, and advice in order to get the most out of life.

Heart disease is much more common in cities than in rural areas. It is much more common in congested areas of cities than in the less congested. It is much more common also in the North than in the South. In the extreme South it is practically nonexistent, but it is more frequent among Negroes than whites. DePorte [1] estimated that 75 per cent of all cases of heart disease in children develop under ten years of age.

There has been an alarming increase in the number of cases of heart disease, as well as in the mortality. In 1900 heart disease was the fourth in order of causes of death, but at present it has moved to first place in the United States. Part of this increase has been due to a reduction of the number of deaths from other diseases, and part to the earlier medical diagnosis of heart disease. In New York City it is the leading cause of death among teen-age girls and in boys is second only to accidents. From these facts and figures it is evident that much more attention both by medical and educational agencies must be given to cardiac conditions. There is an actual increase in numbers afflicted with some degree of defect. There is also a high incidence of fatalities resulting from them even in children. There has been gradual improvement with regard to the death rate for cardiacs, in childhood, adolescence, and early adult life. Aside from New York City and a few other metropolitan areas, there is comparatively little special educational provision for cardiacs.

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[1] J. V. DePorte, "Heart Disease Among Children of School Age," *New York State Journal of Medicine*, 1934, **34**, pp. 448–450.

Classification of Heart Diseases

The American Heart Association [1] adopted the following plan for the classification of Cardiopathic and Circulatory Disturbances.

Organic Heart Disease:

- Class I: Patients with *organic disease*, but *able to carry on ordinary physical activity.*
- Class II: Patients with *organic disease*, but *unable to carry on ordinary physical activity* (Cardiac Insufficiency).
  - A. Activity slightly limited.
  - B. Activity greatly limited.
- Class III: Patients with *organic disease*, but *unable to carry on any physical activity*, i.e., who must remain in bed or in a chair (Cardiac Insufficiency).

Possible and Potential Heart Disease:

- Class E: Patients with *possible heart disease*, not believed to be due to organic heart disease.
- Class F: Patients with *potential heart disease.* Patients without circulatory disease whom it is advisable to follow because of the presence of history of an etiological factor which might cause disease.

Classes I, E, and F of the above classifications may usually attend regular schools. Class II, A and some of II, B are selected for special classes. Class II, B of the more severe type and Class III of less severe types may have home teaching. Class III of the more severe type of bed cases should probably receive no instruction because of too severe illness.

There should be frequent reexaminations because conditions may change and classifications are subject to change. The decision as to types and all matters of examination should lie exclusively in the hands of the heart specialist, known as the cardiologist.

Symptoms of Heart Disease

Some of the symptoms of heart disease which may be observed in the schoolroom are: breathlessness from exercise; flushed or slightly bluish color to the cheeks, lips, or fingertips;

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[1] Adopted and distributed by American Heart Association, Inc., 450 Seventh Avenue, New York City.

easy fatigue; a frequent dry cough; and chest pain after active physical exertion. Some of these symptoms may be indicative of other conditions. As in the case of other defects, one or more of these symptoms should cause a teacher to ask for a cardiac examination. She should never be discouraged if her suspicions about heart conditions are not verified in every case.

Types, Causes, Remedies, and Prevention

There are four main types of heart disease divided roughly according to age: congenital forms in infancy and early childhood, rheumatic infections in the next age period, syphilitic infection in middle age, and arteriosclerotic changes in later life.

As noted above, rheumatic fever is the chief cause of cardiac involvement in childhood. Its cause is not known, but it is associated with cold, damp weather, poverty, and poor housing. It is a chronic infection which does not run a short, specific course. Heart disease may follow long periods of illness, particularly fevers of various kinds.

Weyher[1] has discussed several other uncommon forms of heart infections, i.e., those caused by fungi or molds, parasites, and the type known as vegetative valvular heart disease or *endocarditis lenta*. The latter is really a form of streptococcus infection superimposed upon another infection or deformity of the heart valves. It may follow rheumatic or congenital heart disease in childhood or syphilitic heart trouble in adults; it is insidious in its attack and most always fatal. The other heart diseases mentioned above are not important in children.

Weyher also points out the liability of children with congenital heart deformities, i.e., imperfections of the heart formation which occur before birth, to subsequent diseases. This is because if the heart valves are imperfect, eddies or stagnant parts of the blood circulation may allow germs to collect and multiply, thus causing serious damage to the heart.

Heart conditions may be associated with decayed teeth, diseased tonsils and adenoids, and chorea. There may be two connections or associations between these various etiological causes and the area of topographical causes. The heart may become diseased from the infiltration into the blood of infections from the tonsils, teeth, or other portions of the body. By the circulation of the blood they are constantly carried through the heart in a never-ending stream. The blood stream which interconnects all parts of the body is a most potent source of carrying infections from one portion of the body to all others and particularly to the source of its circulation—the heart. Many people feel that diseased tonsils amount to no more than the inconvenience of sore throat, or that aching teeth are merely aching teeth and nothing more, but if they realized their possible significance in terms of heart trouble, there would be less apathy and indifference to these common childhood ailments.

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[1] R. F. Weyher, "Infections of the Heart," Address at Wayne County Medical Society, June, 1942.

In the treatment of heart conditions the removal of the source of infection where possible is the first consideration. In the period of convalescence it may be necessary to hospitalize the child while the immediate causes of the infection are being removed. There should be a long period of rest while the heart is regaining its former strength, and all exercise should be gauged strictly according to the physician's orders. Rest in bed and proper nutrition are essential parts of this program. Obviously it may be seen that if there is no knowledge of heart disease, and the child's usual schedules of extreme physical activity are continued, serious trouble may develop.

History of Cardiacs

There is comparatively little recorded about the history of cardiac disease. William Harvey (1578–1657) made studies of the circulation. These were really the beginning of the modern era regarding the heart. There seems to be little evidence as to the time when any special classes were organized for cardiac cases. Some of the cardiac cases were enrolled in the classes for lowered vitality, although the earlier membership in those classes was limited chiefly to cases related to tuberculosis. In Detroit in 1930 there were 603 children known to have heart disease enrolled in the public schools; of these 544 were in open-air schools or open-window rooms and 59 in special rooms for heart cases only. Later, many of these cardiac cases were shifted to orthopedic schools for convenience of bus transportation.

In 1915 the Association for Prevention and Relief of Heart Disease was organized and later it became known as the New York Heart Association. The American Heart Association has united with the New York Tuberculosis Health Association and has become the heart committee of this association.

Current Problems in Teaching

The problems of where the cardiac cases should be housed or with whom they should be classified is still a matter of practical concern. Originally they were placed with other types of lowered vitality or in special classes by themselves. More recently some have been placed in orthopedic schools.

The possible psychological effects of complete or partial segregation have never been determined. It may be feasible to place them in special rooms on a part-time basis each day, somewhat similar to the plan for speech defectives where emphasis upon health and prevention would be given. If a very thorough and careful check is kept on their physical conditions in regular grades, the need for special segregation becomes less important, but it will be some years before such an Utopian condition will be found. Until that time the necessity of making some special provision is apparent.

The causes and necessary remedial measures for cardiac conditions are well-known today. It remains chiefly a matter of putting an efficient medical and educational program into effect.

QUESTIONS AND TOPICS FOR DISCUSSION

1. List the symptoms of heart disease.
2. Make a detailed report of the Halsey Committee of New York City.
3. Have an explanation of cardiac conditions by a cardiologist.
4. Visit a class of cardiacs and report on its health and educational program.

Chapter XIII

MISCELLANEOUS PHYSICAL CONDITIONS

There are many other physical and sensory disabilities which comprise a miscellaneous group. Three types will be mentioned and described in this chapter. They are: lateral dominance, with chief reference to handedness; defective teeth; and albinism. Among these three, defective teeth are the most common, but with fewer marked emotional and psychological disturbances. Handedness is next in order of frequency but with many implications for educational and vocational adjustment. Albinism exists less frequently but with its subjects more handicapped and maladjusted than either of the others.

There is no particular neurological, psychological, or educational connection between these three kinds of physical conditions and they are merely grouped together for convenience.

Lateral Dominance

"Lateral dominance" is a modern term for a general condition which was known earlier mainly as handedness. As the term suggests, one side of the body is more dominant than the other in terms of strength, agility, or in a feeling of ease when the dominant member is used. Handedness is one of the chief elements of lateral dominance, although recent studies have been made of eyedness, footedness, and general bodily dominance. In the present discussion of dominance, handedness or dextrality will be the principal topic of interest.

While the great majority of people are right-handed some are left-handed, and a few are apparently ambidextrous or equally skilled with either hand. Some of the left-handed have been changed to use their right hands. At first thought it might seem that this whole matter should be of little or no importance. Many studies of handedness show that it is closely related to strong emotional disturbances, to certain types of speech defects, and it is also associated with disability in reading.

Psychological Characteristics

Emotional. The chief emotional disturbances arise among children who have been forcibly changed in their handedness, or in those who are ambidextrous rather than in those who remain strongly left-handed. Wile [1] reports that the conversion of handedness results in awkwardness, poor muscular coordination, irritability, restlessness, slow thinking and confusion, with a feeling of inferiority and general behavior maladjustments. He believes that when changes are made, certain inherent neural arrangements are disturbed, resulting in the development of abnormal tensions. Turner [2] noted among adolescents that the emotionally unstable tend to have more undetermined preference for eye, hand, and foot than do the emotionally stable. Other comparisons between right-handed and left-handed children who have not been disturbed or changed in their handedness show little difference in emotional factors. One exception in this respect is the report by Fitt and O'Hapolran [3] in which dominantly left-handed boys seemed to be somewhat more psychopathic than right-handed boys.

There is a certain type of intellectual confusion or blocking which the author has observed and discussed with friends and associates who are left-handed. It centers around the problem of when to use or not to use the right hand. Whenever a right-handed person performs some act and expects the left-handed person to follow, the latter must frequently pause to consider whether he should do it with the left hand or the right. In other words, he must decide whether he should proceed with his dominant hand in his own natural way, or, in order to coordinate with others, he must transfer to the right hand. For example, when a right-handed person shakes hands he naturally uses his right hand. The left-handed person would naturally use his left, but on account of the awkwardness resulting in shaking hands with a right-handed person he must translate or transfer to his right hand. These translations may become so extreme in some individuals that the left-handed driver may even make a wrong turn in driving, because he reasons that if a right-handed person requests a right turn, he himself should make a left turn since he is left-handed. There are literally hundreds of daily situations in school and elsewhere in which the left-handed child must not only understand what is to be done, but must determine whether he should transfer or not, or whether it makes any difference. Average or mentally superior left-handed children probably learn to make most of these adjustments easily, but the slow-learning and feeble-minded live in a state or some mental and emotional confusion over the dilemma.

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[1] I. S. Wile, "The Relation of Left-Handedness to Behavior Disorders," *American Journal of Orthopsychiatry*, 1932, **2**, pp. 44–57.

[2] E. Turner, "Studies in Eye, Hand and Foot Preference. Part 4, Eye, Hand and Foot Preference of Emotionally Unstable Adolescents Compared with Stable Adolescents," *Journal of Juvenile Research*, 1938, **22**, pp. 122–125.

[3] A. B. Fitt and K. H. O'Hapolran, "The Relation Between Handedness and Some Physical and Mental Factors," *Journal of Educational Psychology*, 1934, **25**, pp. 286–296.

Intelligence. Several studies by Pyle and Drouin,[1] by Haefner,[2] and by others, show a slight trend to lower intelligence on the part of left-handed than right-handed, but the differences are not statistically significant. There is almost complete overlapping of the two mental distributions with left-handed found among the mentally superior and gifted, as well as at the other mental extreme.

Haefner also studied such factors as height, weight, and other physical data with the conclusion that there were no statistically significant differences between the right-handed and the left-handed in these areas. Differences in school achievement are also on about the same level of minor significance.

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[1] W. H. Pyle and A. Drouin, "Left-Handedness: An Experimental and Statistical Study," *School and Society*, 1933, **36**, pp. 253–256.

[2] R. Haefner, *The Educational Significance of Left-Handedness*. Teachers College Contributions to Education, No. 360, Columbia University, New York, 1929, 84 pp.

The Number of Cases

There are various estimates of the number of the left-handed. Some are based on surveys, others rely mostly upon speculation from small samplings. Betts [1] lists eighteen different investigations with estimates ranging from 2 to 40 per cent. Many of the investigations which were based on large numbers of cases arrived at about 6 per cent as the most reasonable figure. 6 Haefner [2] found that approximately 88 per cent were right-handed, 6 per cent were left-handed, 5 per cent were mixed or ambidextrous, and 1 per cent were doubtful. Parsons [3] found about 29 per cent to be left-handed, which he believed to prove that left-handedness was a recessive Mendelism trait in which theoretically 25 per cent of the population would be so endowed. His estimate is quite close to this percentage. Carrothers [4] found 8.2 per cent of 225,000 pupils in 365 Michigan schools to be left-handed, but with wide variation from one area to another, and from grade to grade. He concluded that environmental causes of left-handedness are on the increase.

Methods of Diagnosis

There is no single test which may be used to determine handedness. Several test batteries have been developed. It should not be assumed that merely because a child uses his right hand or his left hand regularly for most operations that he is naturally handed in that direction. There are some left-handed children who have been trained to do most things right-handed and vice versa, so that mere use is not a safe criterion of true handedness.

For young children various investigators have devised tests of noting which hand was used when cutting with scissors, winding a string around a pencil, throwing, reaching, and other simple tasks. Speed and accuracy of tapping with an electrical recorder is used, alternating trials with each hand, testing strength of hand grip by the dynamometer, with the predominant hand showing the most strength. Ojemann[1] notes that the hand farthest from the "business" end of the shovel or broom is the dominant hand with the right-handed person, shoveling toward the left with his left hand nearest the shovel. West, Kennedy, and Carr[2] tested for handedness children who were advanced enough to be familiar with writing to write the numbers 1 to 7 on the blackboard with both hands simultaneously while looking down at the floor. They show five specimen cases with two of them in some confusion as to sidedness by reversals in certain of the numbers. Through these various tests and others the true status of handedness may be determined.

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[1] E. A. Betts, *The Prevention and Correction of Reading Difficulties*, Row, Peterson & Company, Evanston, Ill., 1936, p. 119.

[2] R. Haefner, *op. cit.*

[3] B. S. Parsons, *Left-Handedness*, The Macmillan Company, New York, 1924, 185 pp.

[4] G. E. Carrothers, "Left-handedness Among School Pupils," *American School Board Journal*, 1947, **114**, No. 5, pp. 17–19.

Causes of Handedness

There are many theories about the causes of handedness. Some of them are difficult to verify or explain. For example, it is claimed that right-handedness is determined by the heavier weight on the right side of the body of the liver and other organs. However, in left-handed persons the liver is not on the left side. Other theories advance the idea that training is the chief determinant. If this were so, there would ultimately be very few left-handed persons since left-handedness has too often been considered incorrectly as a sign of mental inability or degeneracy.

As to any physiological cause of handedness, it is believed by some to be related to speech and to the development of the Broca speech center. This center is located in one hemisphere of the cerebrum. None of the animals have developed speech except man, and none have handedness so far as has been discovered by careful tests and investigation. In the evolution of speech in man there came to be a gradual specialization of the neurological processes of speech in the Broca speech center. The motor areas which control and direct the muscular movements of the body are localized in the same general areas as is the Broca speech center. In the course of neurological evolution and development, various neural areas appear to have developed some specialized locations such as the Broca area for speech. It may be that one or more areas of lateral dominance is placed in juxtaposition with the Broca area and results in disturbed speech when forced handedness changes occur. The problem of speech and dominance relationship is one of speculation which may be disclosed further through the techniques of refined medical science. There is probably no complete division of this type since the various processes of the brain are known to be somewhat scattered and diverse. In the case of ambidextrous individuals and in those whose handedness has been changed, there are frequent disturbances of speech, and of reading, with reversals of letters and words.

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[1] R. H. Ojemann, "Studies in Handedness; II, Testing Bimanual Handedness," *Journal of Educational Psychology*, 1930, 21, pp. 695–702.

[2] R. West, L. Kennedy, and A. Carr, *The Rehabilitation of Speech*, Harper & Brothers, New York, 1937, pp. 132–134.

As to reasons for handedness occurring in the right or left sides, many authorities believe that heredity plays the significant role. Left-handedness is believed to be a recessive Mendelian trait with right-handedness the dominant. In some families it may occur in the reverse order, with left-handedness being the dominant trait. According to the Mendelian theory, one-fourth of the people would be left-handed, and one-half of the total would be carriers of left-handedness although they themselves would be right-handed. Chamberlain[1] reports that in fifty-five families in which the mother was left-handed, 13.77 per cent of the children were left-handed; in eighty-two families in which the father was left-handed, 9.7 per cent were left-handed; while in thirty-three families in which both parents were left-handed, 46 per cent were left-handed. It has been noted earlier that the probable reason why many studies report only 6 per cent left-handed instead of 25 per cent is that many learned to be right-handed by example and training.

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[1] H. D. Chamberlain, "The Inheritance of Left-Handedness," *Journal of Heredity*, 1938, **19**, pp. 557–559.

History of Handedness

Left-handedness has been known since the earliest dawn of history. Several of Egypt's Pharaohs, and most of the Caesars of Rome were left-handed, as well as Alexander the Great, Charlemagne, and Michelangelo. At present left-handedness has become more popular since left-handed baseball players are at a premium in batting against right-handed pitchers. In doing so they can more easily note the course of a curving ball from a right-handed pitcher as well as being several feet nearer to first base while at bat. In spite of some famous men and baseball preferences there has always been undesirable odium attached to left-handedness. The early Latin word for left was "sinister" and that word in the English language gradually took on it unfavorable meaning.

The slight general awkwardness and inconvenience of trying to do things left-handed in a right-handed world have probably created these unfavorable impressions, rather than the character of the persons themselves. A great majority of operations performed by man have been made for the right-handed, so that the left-handed are placed in a difficult position. Even sitting closely together at the traditional boarding-house offers its inconveniences for the left-handed. Some things have been adjusted to left-handedness such as left-handed golf clubs and a few violins which have been built with the strings in reverse order, so that bowing is done with the left hand instead of the right.

Effects of Changing Handedness

Changing the handedness has been a very controversial subject, and authorities disagree about its feasibility. If it is done very early in the child's life before his speech habits are well established, and without emotional conflict, there seem to be no injurious consequences. However, in cases where the handedness is very strong, complications occur, because the habit persists. It may be that success in change is limited chiefly to cases where handedness is not very dominant. There are very frequent relationships between disturbances of handedness and speech defects. Some writers believe that these are related only through emotional upsets from forcible change of handedness. There is also some evidence that they are related through neurological channels. Many children who have reading disability also have irregular handedness. Some have been forced to change, others are ambidextrous.

Handedness and School Subjects

It has been noted that there is a relationship of handedness to poor reading. Handwriting is also difficult for many left-handed children. The left-handed child naturally wishes to write from right to left which would result in what is known as mirror-writing. It could be read by looking at it through a mirror. Since this style of writing is not ordinarily legible, the left-handed child resorts to awkward and inefficient methods of writing with his left hand. Some of these methods consist of placing the paper and the hand at an awkward angle. The writing is principally a series of up and down strokes without regular spacing between letters and with no rhythm of hand movement. Writing progresses slowly toward the writer's body. In a bulletin from Cincinnati, Condon[1] advised that the paper be placed in position just the opposite from right-handed writing with the hand and pen below the line so that the writing could be seen in the course of the process.

Problems of Eyedness

Thus far the discussion of laterality has been concerned with handedness. In recent years there has been a growing awareness that there is also dominance as to the eyes, as well as to other parts of the body. Miles[2] found a majority of right-handed individuals to be right-eyed, whereas left-handed adults are divided about equally between right- and left-eyed. There is probably a relationship between the ability to write and eyedness. Eyedness offers problems, also, leading to success in some operations, but to failure in others. A simple test of eyedness is to have the child look through a long mailing tube for which he uses the preferred eye.

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[1] R. J. Condon, "Advice with Regard to the Treatment of Left-Handed Writers," *Elementary School Journal*, 1927, **27**, p. 490.

[2] W. R. Miles, "Ocular Dominance in Human Adults," *Journal of General Psychology*, 1930, **3**, pp. 412–430.

Since there has been much confusion and difficulty in a successful education of children with disturbances of handedness and eyedness there should be much more research upon this important topic. While no special classes are provided for cases of dislocated handedness, they are worthy of special study and interpretation in the regular classroom.

QUESTIONS AND TOPICS FOR DISCUSSION

1. If you are left-handed or have been changed, describe how you adjusted to it.
2. Describe some person whom you know with similar problems.
3. Make a more detailed report of mirror-writing such as is outlined in Scheidemann.
4. Consult texts on speech correction for the importance of handedness in speech work.

The Teeth of Children

Although no types of special classes or schools are established for children with defective teeth, there is much pain, infection, indigestion, loss of school time, and many other attendant ills arising from this source. Since a toothache or the loss of a tooth is not considered as serious as an eye injury or deafness there is probably more neglect of this physical condition than of nearly all others.

Psychological Characteristics

There is a minor relationship between the condition of the teeth and intelligence. In a study by Ayres, reported by Terman and Almack[1] of children with defective teeth, among 3304 boys 10 to 14 years of age, 42 per cent of the mentally slow, 40 per cent of the average, and 34 per cent of the rapid learners had defective teeth. There are probably some low positive correlations between intelligence, social conditions, and care of teeth, since brighter children, as a group, probably have better homes, more economic opportunities, and parents who pay more attention to their teeth.

The emotional factors in care of the teeth are often quite important. In the process of losing the first or baby teeth at about the age of six or seven years, many children are mildly teased or even ridiculed as being toothless. Recently the author sat in an audience at a school entertainment with many parents in attendance in which an uproar of laughter arose when a small group of first-grade children disclosed gaping holes from lost incisors. Many children are able to weather such incidents with little concern, but others of a more sensitive nature undoubtedly become emotionally disturbed.

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[1] L. M. Terman and J. C. Almack, *The Hygiene of the School Child*, p. 179.

Another source of upset about teeth arises from the fact that decay is sometimes allowed to progress to such a serious degree that extreme pain from exposed nerves results. This pain is then associated with the necessary work of the dentist, and although the actual pain is a small feature of the dentist's activity, nevertheless it is all accredited to him. Future visits to his office are delayed and postponed as long as possible. These unpleasant experiences are sometimes aided and abetted by stories of similar incidents upon the part of parents, enlivened by a touch of subconscious sadistic delight. A program of early prevention without these undesirable features is one of the first prerequisites to better oral hygiene.

The Number of Cases

Decayed and defective teeth are very common among children, although conditions are slowly improving. Terman and Almack [1] quote various sources to the effect that from 60 to 80 per cent of all children had dental caries or decayed teeth, and with an average of about one-third of the teeth affected. What decayed teeth may lack in severity of effect is offset by the almost universal prevalence among overwhelming portions of the population. In the first year of World War I, 10 per cent of the drafted American men were rejected on account of extreme dental conditions. It is evident that conditions among young adults are probably as bad as in children. Sloman reported more dental caries among girls than boys, but with a reduction in the frequency for both sexes by middle life. The intensive drive for the improvement of health and physical conditions in many communities, including the larger cities, will undoubtedly embrace a gradual improvement in the condition of teeth as well.

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[1] L. M. Terman and J. C. Almack, *ibid.*, pp. 168–173.

The Development of the Teeth

The teeth pass through four stages of development, requiring a period of years. The first period is the growth of the main portion of the tooth while still hidden in the gums; the second period is calcification in which the hardening of the tooth takes place; the third period is the appearance of the tooth through the gums, known as eruption, or cutting of the teeth, and the fourth period is known as attrition or the process of wearing down to fit the bite on the other teeth and from constant use. The teeth begin to form when the human embryo is about one-half way through the period of pregnancy. The permanent teeth begin forming below the roots of the temporary or deciduous teeth which are commonly called the milk teeth. It takes from seven to fourteen months for the formation of the crown of a deciduous tooth, but from three to six years for a permanent tooth, and about as long accordingly for the formation of the roots. Cattell's[1] scale for measuring dental age shows girls teeth erupt about six months earlier than boys throughout all age ranges.

Causes of Maldevelopment

There are many types of irregular and faulty development of the teeth. Some are caused by general hereditary conditions and the immediate physical condition of the mother during pregnancy. In general, breast-fed babies have better teeth than bottle-fed; the longer the breast feeding the better the teeth tend to be. This fact indicates that there are probably certain chemicals and components in the mother's milk which may be lacking in cow's milk. There is undoubtedly some relationship between food values in childhood and the proper development of the teeth as well as other portions of the body.

Irregularities in the teeth are frequent, with various causes such as extra teeth, teeth out of alignment in the jaw, and teeth spaced too widely so that some speech sounds are difficult to make. In recent years there has been an increase in dental surgery with the use of braces to correct faulty alignment and undesirable appearance.

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[1] P. Cattell, "A Scale for Measuring Dental Age," *School and Society*, 1928, **27**, pp. 52–56.

The cause of teeth decay and the formation of caries or decayed spots are matters of great significance. It has already been noted that feeding the baby milk is one of the factors in the formation of teeth. Teeth that are susceptible to decay contain more magnesium than sound ones. Terman and Almack [1] quote Wallace to the effect that solid foods are much more desirable than soft or pasty foods because the latter are forced between the teeth so tightly that no amount of brushing is able to get them perfectly clean.

One of the chief causes of decay is the lodgment of foods in irregular spaces between the teeth. The decay spreads through weak spots or cracks in the enamel. It may not be discovered until it approaches the nerve near the center of the tooth, and by that time an advanced stage of decay has already been reached. Pyorrhea is a very frequent cause of teeth decay. A hard substance known as tartar forms between the teeth and gums, where the usual cleaning by toothbrush or the cleansing action of the tongue does not penetrate. The gums become infected and pus pockets form around the roots of the teeth. The gums bleed easily and the teeth often become loose and sometimes must be removed. It is also believed that bacteria may cause pyorrhea; this in turn may be caused by dietary deficiency. Frequent cleaning of the teeth by a dentist and antiseptic treatment, together with filling all cavities, are useful preventive measures.

When the condition of the teeth becomes very bad, other complications occur. The food cannot be properly masticated and an additional heavy burden is then placed upon the stomach, resulting in indigestion and its attendant disorders.

Whenever there is active dental infection it may pollute the blood stream and be carried through all parts of the body, resulting in complications in many other areas. The heart is often affected since the tainted blood stream finds a vulnerable target in its continuous circulation. It may be seen, therefore, that care of the teeth is not a simple matter related only to the teeth themselves, but affects many other portions of the body with far-reaching effects upon general health.

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[1] L. M. Terman and J. C. Almack, *ibid.*, p. 186.

Preventive Measures

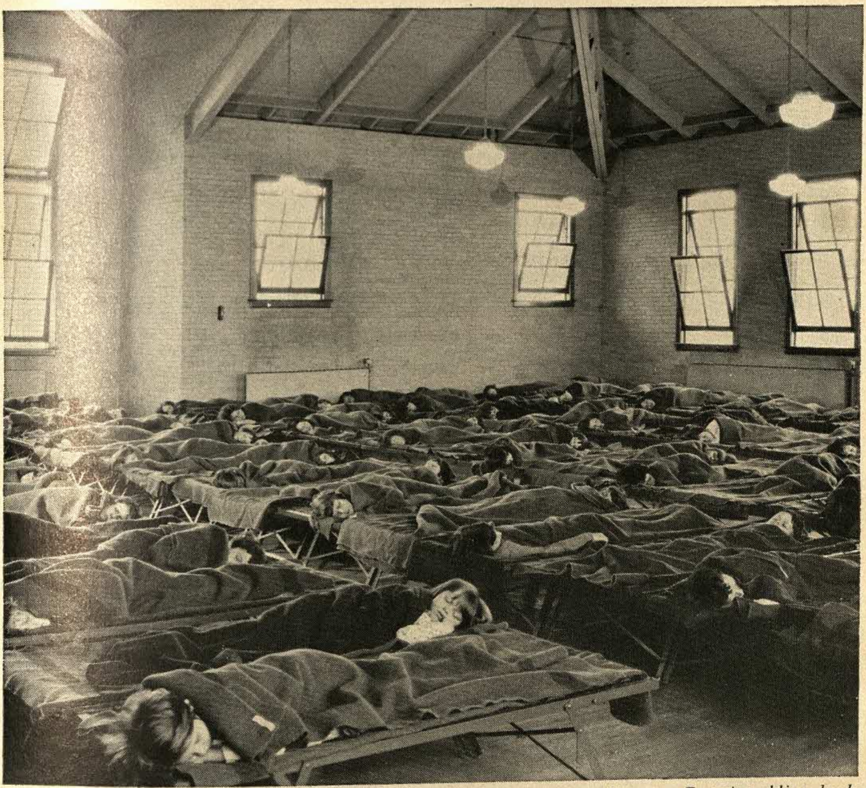
Various prophylactic measures are helpful in the program of prevention. Care to avoid cracking or breaking the teeth from biting hard substances, or from breaking them in accidents are some basic precautions. The number of children who have their teeth broken from sitting in the "death" seat beside the driver and hitting their teeth upon the cowl is very great. A suitable diet from earliest babyhood and suitable prenatal care for the mother during pregnancy are important first steps in the program. Daily care and brushing the teeth from early childhood are fundamental. Consulting the dentist at frequent intervals with correction of beginning caries is very important. The health inspection of all children by teachers with follow-up by nurses and by school dentists or by private dentists are hopeful signs of general improvement. If the teeth can be kept in good condition through adolescence and into early adulthood, habits will have been established and there will be less difficulty in later years.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Discuss your childhood dental experiences, stating whether they were pleasant or unpleasant, and why.
2. Discuss advanced cases of teeth neglect with which you are familiar and describe the complications.
3. What did your school system do about children's teeth when you attended elementary school? What does your present school system do about it today?

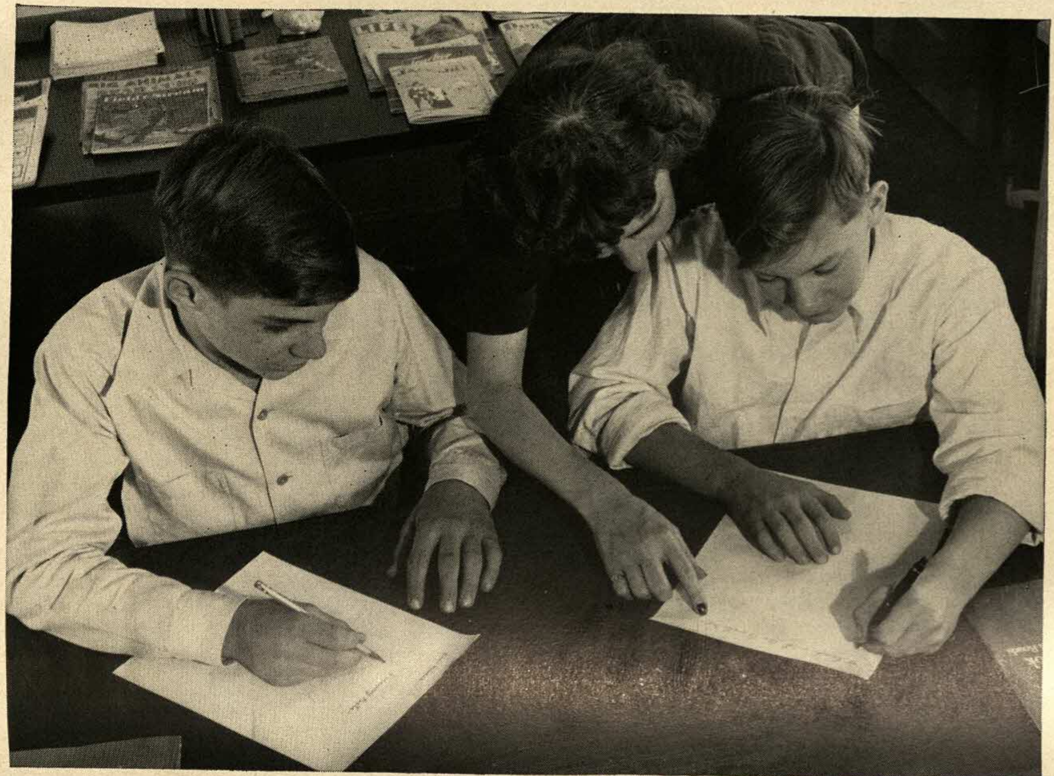
Albinism

At some time or other most people have seen an individual with a striking shade of white hair, a delicate or pink skin, and squinting and unusual appearing eyes. Such people are known as albinos. It was probably easy to pass them by with



Courtesy Detroit public schools

Rest period, open-air school, Detroit public schools.



Courtesy of The Reading Clinic, Temple University

Showing position of paper for right- and left-hand writing at The Reading Clinic, Department of Psychology, Temple University.

the belief that it would be hard to cultivate them as intimate friends on account of their unusual characteristics. Some of these qualities will be discussed.

Definitions. Scheidemann [1] offers the following definition:

> For practical purposes an albino may be defined as an individual having skin of milky whiteness or of characteristic pallor, white hair, possibly tinged with yellow or straw, eyes with pink or red pupils and pink, red, violet, very pale blue or blue-gray irises, and the usual accompaniments of nystagmus, photophobia and defective vision.

It may be noted from this definition that there are many varieties of physical characteristics which are probably minor deviations affecting the three major areas of the hair, the skin, and the eyes.

Psychological characteristics. In common with other types of the physically defective, albinos do not feel that they are accepted socially. Hence they become emotionally blocked. Other children feel that they are difficult to understand. Their extreme susceptibility to ordinary light makes them cautious and unable to play wholeheartedly and vigorously with their classmates and associates. A few of them have been placed in sight-saving classes because of their eye conditions. Such placement probably helps to reduce their feelings of social isolation, since their classmates also have physical defects.

There is an extreme range of intelligence represented in albinos. Some of them are found in institutions for mental defectives, but possibly without true intellectual retardation. They may have been placed there because of social and emotional deviations and lack of schooling, all of which emphasizes the need for better and more universally applied measurements of intelligence and other significant traits. Scheidemann reports that all of the albinos in the Los Angeles public schools have intelligence above average, with some rated as superior. She notes that all of them are characterized by eyes with black pupils which infers that they are not true albino types. The rage for platinum hair tended to create a class of normals more nearly similar to the albinos, but this innovation did not give them much aid or comfort.

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[1] N. V. Scheidemann, *Psychology of Exceptional Children*, Vol. II, p. 186.

Number of cases. The number of albinos is comparatively few. Various estimates in different countries, based upon inadequate surveys, show one case in approximately every twenty thousand of the population. In Glasgow there were seven or eight albinos among approximately one hundred thousand children of school age. As with other defects there are probably many more partial cases who do not show the extreme or pure characteristics usually associated with the albino.

Physical characteristics. Congenital absence of pigment either partial or complete, from the eyes, hair, and skin are the most common characteristics of albinism. Only one or two of the areas may be so affected. The skin has a dull pallor, often with a reddish tinge, because of the blood showing under its thin and delicate surface. A soft, white down often covers the body, giving the general impression that albinos have a soft, delicate bodily texture. This impression of delicateness is also carried out in the hair which is fine, silky, and usually white, due to lack of pigmentation. Special types of albinos with red hair have been found in some investigations. They are known as rufous albinos.

The eye condition of the albino is important from an educational and occupational point of view. Due to the lack of pigmentation in the iris and to its general thinness of texture, ordinary light passes through it too easily and illuminates the blood vessels so brilliantly that it is reflected back to the observer, giving the iris and pupil a red appearance. Under such circumstances the vision of the albino is very poor. Photophobia, or fear of light, is a common characteristic. Since his eyes may actually be weak, seeking dull light results in the eyestrain and further complications. Nystagmus, or a rhythmic oscillation of the eyeballs, is common in albinos and probably is nature's attempt to avoid too much light. Sometimes the nystagmus is only a horizontal motion, sometimes the eyeballs tend to rotate. There are many types of visual defects in albinos, including strabismus, amblyopia, and others which make school very difficult. Albinos tend to show many of the neurological and psychological characteristics of defective-vision cases such as are usually enrolled in sight-saving classes.

Causes. The area or topographical cause of albinism is lack of pigmentation. The etiological causes are known to be hereditary. Albinism is governed by the Mendelian laws of heredity as a recessive, rather than a dominant trait. It occurs only when both parents have been "carriers," and the recessive state may not have made its appearance in either family for one or more generations. There is no way to determine the existence of such carrier traits except through mating. Albinism tends to exist more frequently in districts in which there are many consanguineous marriages. Nearly seven hundred families [1] have been studied in which albinism has existed and which serve as the basis of the knowledge about heredity as the cause of albinism.

Albinos have been found in every race, including Negroes, and in all parts of the world. Albinism has been known throughout the ages but in the early days was mentioned chiefly by writers of classics rather than by physicians or other scientists.

Outlook. The lack of pigmentation is one of the most profound secrets of nature and any discoveries by which it may be restored as an active function of the human body are possibly as unlikely as a practical substitute for the heart. The number of albinos is comparatively small, but their educational plight has been rather extreme. A few of them are enrolled in sight-saving classes which is probably the best educational solution. Their conditions sometimes become less extreme in adult life, probably due to better adjustment of their eyes to light.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Describe an albino whom you have known or observed.
2. Make a more complete report on albinism, based on such sources as Scheidemann, Vol. II.
3. Describe some of the variations of albinism.

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[1] K. Pearson, E. Nettleship, and C. H. Usher, *A Monograph on Albinism in Man*, Draper's Company Research Memoirs, Dulau and Company, London, 1911, 4 vols.

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4. National Association of the Deaf, Inc., School for the Deaf, Columbus, Ohio
5. Volta Bureau, Washington 7, D. C.
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Part III

Mental Growth and Development

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Chapter XIV

THE NATURE OF INTELLIGENCE

There has probably never been any other project or activity in education which has created so much interest and controversy as intelligence. In order to have a better understanding of its significance it is desirable to outline a brief sketch of intelligence and its testing.

For centuries men have puzzled over differences between individuals in ability to learn, to reason, and to get along in whatever station of life they lived. Very barbaric punishment and ridicule were meted out to the mentally backward in medieval days. Even today many scorn the great group of hangers-on who swarm about the poorer sections of cities throughout the world. In contrast, some of the mentally gifted have been honored and extolled for their beneficial discoveries to civilization, while others equally gifted have been denounced, persecuted, and hanged for discoveries in opposition to men's beliefs. Man himself and his abilities have always been among the greatest mysteries of the world, and only now are they slowly beginning to be understood.

The mystery of human abilities has caused them to be the subject of philosophical study and speculation for many centuries. In the search for truth, philosophers not only pondered over the reasons behind truth but also turned to a study of the mind itself as the instrument for deductions about truth. A group of philosophers who devoted their chief attention toward mental processes and the mechanics of thought became known as psychologists. For many years psychology continued under the general sponsorship of philosophy, as testified by the fact that in many universities psychology remained under the department of philosophy. In the early days of the American

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Psychological Association meetings were held jointly with the American Philosophical Association; later they held meetings together on alternate years and on the other years the psychologists joined with the meetings of the American Association for the Advancement of Science. Finally the psychologists went on an entirely independent basis but with leanings toward science rather than philosophy. It might well be that a renewal of a closer alliance with philosophy would be highly beneficial since there must continue to be much speculation and reasoning about the operation of the human mind. At least some effort should be made to avoid the fallacy of believing that all mental processes can be summarized into an I.Q., however useful such measurements have proved to be.

History of Psychological Testing

attell

The modern period of psychological testing was begun in a modest way by Dr. J. McKeen Cattell in Wundt's laboratory in 1879. He discovered that individuals had different rates of reaction time. In the period from 1890 to 1900 Cattell examined students at Teachers College by tests of special abilities but found comparatively little relationship between test results and scholarship. The range of abilities was rather limited among his college students and the tests were of such a simple psychological nature that much less was probably to be expected than from the more comprehensive test batteries than are now available.

Binet

About the same time the French psychologist, Alfred Binet, was having somewhat similar and relatively unsatisfactory experiences with simple psychological tests. By 1905 he devised tests of a more complex nature in order to discover the mentally retarded children of Paris. He had been assigned this task and was faced with the problem of finding some practical means of psychological classification. He improved his scale of tests in 1908 and a third edition appeared in 1911 shortly before his untimely death occurred. At about the same time Whipple in 1910 [1] compiled a book of psychological tests with a second edition of two volumes in 1914 and 1915 under the title *Manual of Mental and Physical Tests.* These books proved very useful and served as a great stimulus to the expansion of testing programs.

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[1] G. M. Whipple, *Manual of Mental and Physical Tests*, Warwick and York, Baltimore, 1910, 690 pp.

Goddard prepared an American edition of Binet's tests known as the Vineland revision in 1911, immediately following the appearance of Binet's 1911 scale. Dr. Terman[1] at Stanford University produced the first Stanford-Binet test in 1916. This test was so well prepared and standardized that for a period of over twenty years it was the chief instrument of mental diagnosis. Revisions of the Stanford-Binet tests were prepared by Terman and Merrill[2] and published in 1937.

In the World War of 1914–1918 soldiers of the American army were examined by group intelligence tests, chiefly the Army Alpha Test, although several other tests were also employed such as Army Beta, Army Performance, and the Short Stanford-Binet. One important result from this examination ① of 1,750,000 men showed the practical usefulness of group mental tests as measures of general intelligence. In modified form they were soon found to be practical for children. A ② second important result was derived from the discovery of the tremendous range of mental abilities represented in this nation-wide sampling of the army. The large number of young men too limited mentally to participate in war activities and the astonishing amount of illiteracy pointed to the imperative need for a better understanding of children's abilities and a program of public education better suited to these abilities and limitations.

Many psychologists who had been in the army testing program returned to civilian tasks of measuring children, and with the concurrent development of many group psychological tests suitable for children of different ages there developed a widespread program of testing beginning about 1920 and continuing unabated ever since. These group examinations are mainly of a survey nature. Careful individual testing pro-

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[1] L. M. Terman, *The Measurement of Intelligence,* Houghton Mifflin Company, Boston, 1916, 362 pp.

[2] L. M. Terman and M. A. Merrill, *Measuring Intelligence,* Houghton Mifflin Company, Boston, 1937, 461 pp.

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cedures are reserved for the small number who show extreme deviations on the group results or who are otherwise difficult to evaluate. In World War II diagnostic programs for the armed forces were again established, but with additional attention to personality measurement and to psychiatric examination which has lightened the burden formerly placed on the intelligence test as the sole criterion of success.

Faulty Conceptions About Intelligence

There are many faulty conceptions about intelligence. A few of these negative approaches will be mentioned briefly, as an introduction to the more positive knowledge and theories which follow.

Except in a few extreme cases the degree of intelligence cannot be estimated from general appearance of an individual's facial characteristics. Some good-looking individuals are found among the inmates of an institution for the custodial feebleminded, whereas some very inadequate and insignificant-looking individuals are observed among scientific men. Such irregularities as unusual shape of the nose, the spacing of the eyes, the shape of the lower jaw occur a little more often among the lower levels of intelligence, but since they also are to be found at higher levels they are not safe criteria for the judgment of intelligence. Size of the head is not an index of intelligence, although as a group the very defective mentally have smaller heads than the average. At the other extreme there are hydrocephalics with very large heads who are usually feeble-minded.

Certain types of mannerisms and specialized behavior are not reliable indicators of intelligence. An apparent attitude or pose of concentration, with knitting of the forehead, may be an earnest *attempt* at mental activity, but without much real ability behind the effort. Ability to do one or two simple tasks over and over is of little value in estimating intelligence. For example, the ability to rearrange the upturned corner of a rug is indicative of intelligence only when it is accompanied by successful adaptations to many other commonplace occurrences.

Speed of movement is not very helpful although accuracy may be more significant. A mere flutter of exciting activity without much meaning or purpose is likely to indicate backwardness rather than superiority. Another source of error is ability to talk rapidly but with only a limited vocabulary and scattered ideas which do not reveal logical reasoning. All of these factors tend to confuse the issue in the popular mind and make it more difficult for psychologists to establish bona fide measurements of intellect.

The Neural Basis of Intellect

Before attempting to describe intelligence in terms of everyday behavior some consideration of the foundations of intellect in the human body is desirable. The seat of intelligence is in the brain and central nervous system, rather than in the negative external symptoms which have just been cited. A few details of neural physiology are helpful in understanding the basis of mental activity.

Every nerve has three parts, as follows: a receiving tendon or fiber known as the dendrite into which neural stimulation is received. The impulse is then transmitted through the center or nerve cell into the transmitting tendon or fiber known as the axon. The axon terminates in a brushy tuft of tiny endings which mesh closely with the terminals of the next dendrite. This general area of connection is known as the synapse. The nerves are all constituted in this manner, and those within the brain itself are interconnected in a complicated system of synapses so that a very intricate and detailed system of communication is possible between all portions of the brain. There are two phases of these connections of particular significance to logical and intelligent mental activity. It is believed that in individuals of high intellect, the variety and richness of connections between all portions of the brain are more profuse than in the case of defective intelligence, resulting in much greater richness of mental activity, and providing approaches to problems from many points of view. A second characteristic is believed to be that the synaptic connections of the mentally retarded are more difficult to make; that is, the neural activity

nerve part
① Receiving [illegible]
tendon or dendrite
② Transmitter
tendon or
axon
③ terminals
& connection
or synapse

2 phases
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① more
profuse
in high I.Q.
② Synapse
connections
on M.R. are
not good

passes from one nerve to the next with greater difficulty than in more superior minds.

The nature of neural activity has been one of the mysteries of science. It is known that some type of communication is transmitted along the neural pathways. There are many theories about the nature of neural activity. The possibility of a chemical action is quite doubtful since the speed of neural activity is much greater than the rate of travel of any known types of chemical change. Any theory of a mechanical impulse, such as might travel on a board being tapped at one end and felt at the other, is not practical, since the nerve structure is not rigid enough to carry such impulses. The general trend is toward a belief that electrical energy or current is the basis of neural activity. Although electrical impulses ordinarily travel faster than neural activity, it has been demonstrated that by putting resistance boxes, similar to synapses, in the current's pathway, the rate of electrical transmission can be slowed down to that of the neural activity. It has also been demonstrated that any living cell of the human body has a very tiny, yet measurable, amount of electrical current between the center or core of the cell and its outer parts. Nerve cells follow this same pattern, with possibilities of electrical energy traveling from one nerve to the next through their connecting appendages.

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In recent years it has been discovered that electrical energy in the brain can be measured by a very delicate mechanism known as an electroencephalograph, merely by attaching tiny electrodes or terminals to the side of the head. Recordings are made from the frontal, parietal, and occipital regions of the brain. A series of electrical waves are recorded on a kymograph drum which can be interpreted in very revealing ways. The normal adult has about ten waves per second, and children gradually approach this norm from a slower rate in early childhood up to the adult maximum at about fifteen years of age. In their book *Atlas of Encephalography*, Gibbs and Gibbs [1] record many kinds of brain activity with particular emphasis upon the responses typical of epilepsy. They note that the mentally retarded do not show any characteristics markedly different from the encephalograms of the mentally normal. They remark that the recordings do not disclose richness or meagerness of associations which they believe to be the basis of intelligence.

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[1] F. A. Gibbs and E. L. Gibbs, *Atlas of Electroencephalography*, F. A. Gibbs, Boston City Hospital, Boston, 1941, 221 pp.

In summarizing, intelligence is based on the neurological system, centering in the brain. There are great individual differences in the intricacies of neural connections, and in the readiness in which impulses may travel from one nerve to another. The basis of neural impulses seems to be electrical energy, although the source of such energy is still the crucial mystery of life. Further research along the lines of electrical energy is certain to make further startling discoveries about the nature of mental processes and their deviations.

Summary

Definitions of Intelligence

Definitions have been formulated to describe intelligence from a practical point of view. Binet defined intelligence as the ability to take and maintain a definite direction, as adaptability to new situations, and as ability to criticize one's own acts. Woodworth had a somewhat similar concept in retentivity, or the ability to use facts and activities already acquired, by ready adaptability to novel situations, by curiosity, interest in, and desire to know about things, and by persistence, or the trait of sticking to what is begun. These definitions emphasize adaptability to life situations, which would include not only school learning, but practical adjustment to neighborhood and to social customs. In these fields of practical applications, Thorndike proposed three areas of intelligence: the first is the abstract, or the ability to understand and manage ideas and symbols such as words, numbers, scientific principles, and similar factors; the second is mechanical intelligence or the ability to learn, understand, and manage things and mechanisms; and third is social intelligence or the ability to manage people, and to act wisely in human relations. If a more comprehensive base is desired, it would be feasible to include musical aptitude, artistic abilities, and similar activi-

Thorndike
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③ social

ties which do not fall strictly in some of the other classifications offered by Thorndike.

Differences in Intelligence

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Differences between individuals in intelligence may be expressed in at least three ways according to Thorndike,[1] namely, level, area, and speed. Each of these phases will be discussed briefly.

Level of Intell.

Level of intelligence may also be expressed by the term "difficulty." In most situations the intelligent acts of an average twelve-year-old are at a higher level of difficulty than those of the average six-year-old. At any given age there are a few individuals whose mental level is above or below the average for that age; for example, at the age of nine years there are a few with mental-age levels twelve years or higher, and a few six years or lower. This factor of level or difficulty is one of the more important crucial phases of intelligence since if an individual does not develop into the higher levels, he is eventually considered mentally retarded, unable to progress in school, or to grasp the necessary concepts for successful adjustment in adulthood.

ntell.

The second factor is the area of intellect at any particular level. It is possible for an individual to grasp ideas at the level of ten years but to have experience with or interest in only a few activities at that level. While there is some general relationship between level and area, individuals vary from this trend. For example, in some cases of adult mental retardation in which the level of nine or ten years is reached there is good mastery of a great array of experiences, so that a surprisingly good adjustment is made to simple environments. In other cases of retardation there is a great scarcity of area experiences so that the individual makes a poor adjustment at the mental level of his abilities. It is sometimes observed that in mentally average or superior individuals, mental growth may have been so rapid that they arrived at high levels of ability without much opportunity to develop range or area, having passed by these earlier points with too great rapidity. Their mental developments appear to be poorly balanced, with great possibilities in a few difficult things, but with little experience and insight into much simpler things. These considerations should be reviewed carefully with respect to the policies of advancing the mentally superior and the gifted too rapidly through the school grades even though mental level indicates ability to do work of higher grades. Group mental tests tend to sample into "area" of intelligence much more than individual tests which aim to determine "level," and hence the results of these different kinds of tests may not be expected to agree perfectly.

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[1] E. L. Thorndike, *The Measurement of Intelligence*, Teachers College, Columbia University, New York, 1927, pp. 1–36.

③ Speed of Intell.

The third factor in intelligence is speed or quickness of mental activity. At any given level or within the limits of area, there are differences in the speed with which individuals react. An individual may be at a very high level of difficulty but be deliberate and slow in making his decisions. His mental contributions may be more valuable than those of another who makes decisions more rapidly but inaccurately at the same level. If they are both of equal accuracy, the one who makes more rapid decisions may be more valuable in situations where speed is required, but steadiness of rate is often more important than spurts of speed. Most of the intelligence tests, both individual and group, usually have provision so that the slow worker shall not be penalized too severely. This provision is made by having some untimed tests. It has also been noted that a steady rate of work on group tests with reasonable accuracy secures satisfactory results for those having slow reaction time. There are probably physiological reasons why some individuals have slow reaction times which affect mental as well as physical acts.

These three factors of level, area, and speed make the construction of intelligence tests and the full evaluation of intellectual abilities a somewhat more complicated matter than the amateur builder of tests is inclined to believe. In the light of these factors and the definitions of intelligence some materials of intelligence tests will now be discussed.

Methods of Mental Measurement

Since it is not feasible at this stage of human knowledge to measure the richness of association in the neural connections of the brain, nor the adaptability of the synapses to transmit neural impulses, other means were devised to get projected measures of intelligence. The impracticability of such physiological measures was unwittingly disclosed by a newspaper cartoon some years ago showing a bewhiskered psychologist reading a gauge similar to that used for car batteries and attached in an indefinite manner to the side of the head. A more practical method of examining the individual's intelligence is to compare his answers on standard questions with others whose abilities have been determined by the same material and whose intelligence has been determined by other judgments. This method is similar to the projection method used by astronomers to determine the composition of distant stars. The astronomer studies the spectrum of light with its distinctive bands from a particular star and then in the laboratory develops a similar spectrum from combinations of chemicals. When the two bands of light become identical in their arrangements, it is logical that the combination of elements in the star are identical to those in the laboratory. In like manner the results of intelligence tests from a certain mind matched against the results of known intelligence, produce a logical inference as to the intelligence of that individual. Although the measure may be an indirect reflection of what lies within, by this method of projection reasonably accurate inferences may be made as to the individual's intelligence.

The Content of Intelligence Tests

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② mechanical
③ social
areas

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As suggested earlier, intelligence may be divided into abstract, mechanical, and social areas. In the first of these, many tools and symbols of a verbal nature are used. For example, in the ordinary course of life children acquire a total vocabulary recruited from many sources, in and out of school. The total number of words mounts into hundreds for young children and into thousands for mentally superior adolescents. It is capable of being sampled and these standardized samples may have matched against them the results for any individual, so that his potential vocabulary becomes known. Verbal ability involving complicated concepts have been standardized, such as determining the general classification of some words of a similar type. The task consists of discovering the nature of some classification and noting one word which does not fit into the pattern. Other examples are: a set of words is built into sentences; sentences with blank spaces may be provided into which suitable words are to be fitted; and logical sequences are to be arranged such as "morning, noon, and night" from a mixed or illogical order. In the field of numbers, problems are selected from among familiar situations, based on the experiences to which children have been subjected.

② mechanical intell.

In the area of mechanical aptitudes may be included any type of practical situation requiring manipulation of tools or mechanical devices. Some individuals with much natural ability in mechanical intelligence have very fine insight into mechanical operations even without previous training and experience. Mechanical intelligence includes speed and accuracy of movement, such as putting crosses in circles for a given length of time. The ability to visualize mechanical problems should be included in mechanical aptitude. Auditory ability also plays a large part in mechanical intelligence, such as being able to detect unusual friction from lack of lubrication and faulty operation from parts poorly fitted together. In a large sense the readiness of auditory, visual, and motor tracts to function well is implied in mechanical as well as in abstract and social intelligence.

③. social intell.

The third area is social intelligence or the ability to understand one's fellow man as well as to show acceptable social behavior. This area is measured better by observation of actual performance rather than by answers to theoretical questions of what to do in certain situations. However, since it is not possible to observe all children firsthand for long periods the question-and-answer method serves as a partial substitute. Many mental tests have problems or questions which disclose social concepts. Some children show undesirable attitudes, and a small per cent probably gives theoretical answers quite at variance from their actual practice. Formal answers should always be checked as far as possible against reports by parents and teachers concerning daily attitudes in social situations.

It has been noted earlier that many kinds of aptitudes should be examined if a thorough educational program is to be planned for all pupils. Musical aptitude has been extensively investigated and measurements devised such as the Seashore Tests of Musical Talent, Meier's Test of Artistic Ability, and similar instruments. It has too often been assumed that one test, chiefly of a verbal or abstract nature, was the only element to be tested, whereas tests which measure the individual's ability to make adjustments to all useful environments are most desirable.

Descriptions of Intelligence Tests

In terms of how they are given, tests are either individual or group. The individual test has materials and items suitable for an oral interview. It is time-consuming since from thirty minutes to an hour is usually required of the examiner's time for each case. It allows the examinee to be studied from an individual point of view so that his oral responses may be thoroughly analyzed. While the individual examination is more costly, it is recommended and widely used, as the basis of individual diagnosis. Group examinations may be administered to large groups at a time and the results are recorded on the test blank by the examinees. There is less opportunity to observe the individual personally but the procedure is much more economical of time. For older children some group tests are self-administering, and proctors are needed only for a gross time limit, such as thirty minutes, and to prevent copying or cheating.

The Stanford-Binet Test. The first Stanford-Binet Test modeled after Binet's tests were standardized and published as an individual test from Stanford University by Dr. L. M. Terman in 1916.[1] In 1937 Terman and Merrill [2] produced two revisions, known as Forms L and M. These tests have a series of exercises or subtests arranged by years or by half-years in earlier ages. Materials are drawn from all types of fields such as have been discussed in earlier sections. The examiner begins with a level in which all tests are successfully passed and proceeds through a series of years until all tests are failed. The partial successes are added to the basal level to determine mental age. Very specific directions are given for each part with all instructions to be given *verbatim*. Careful training is needed to do a thoroughly acceptable examination and quite a number of cases should be tested before much reliability is attached to an examiner's results.

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[1] L. M. Terman, *The Measurement of Intelligence*, Houghton Mifflin Company, Boston, 1916, 362 pp.

[2] L. M. Terman and M. A. Merrill, *Measuring Intelligence*, Houghton Mifflin Company, Boston, 1937, 461 pp.

Detroit Tests of Learning Aptitude. This series of individual tests has been developed and standardized in the Detroit Psychological Clinic by the writer, by Miss Bernice Leland,[1] and clinic staff. Since 1935 it has been used as the chief instrument of individual psychological examination on several thousand school pupils annually who need detailed mental diagnosis. There are nineteen subtests and only about one-half of them are usually given to any individual. The examiner selects those suitable to the age of the child and in order to test a variety of mental abilities, including spans of visual attentive ability, auditory attentive ability, motor speed and precision, orientation, verbal knowledge, free association, assembling disarranged pictures, reproduction of geometrical designs, social adjustments, and other areas. A mental age is computed for each part and the median of the parts becomes the general mental age. The results are interpreted not only with respect to the general mental level and its attendant I.Q., but also for a series of mental ages on the various parts of the tests. A sample of the results is shown in Diagram III.

Other individual tests. Wechsler has devised two individual intelligence tests, each of which give separate measures of verbal and non-verbal or performance material. The Adult Scale has two forms[2] and the Children's Scale has only one

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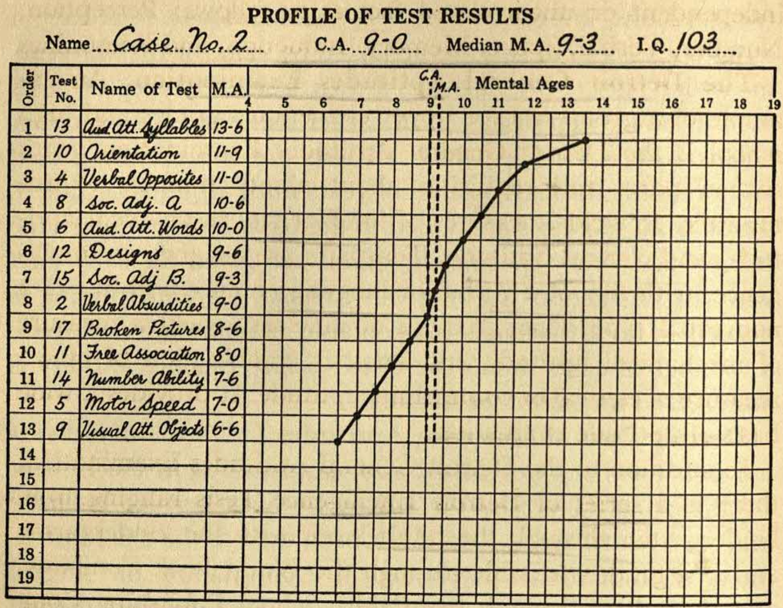
[1] H. J. Baker and B. Leland, *Detroit Tests of Learning Aptitude*, Public School Publishing Company, Bloomington, Ill., 1935, 157 pp.

[2] D. Wechsler, *The Measurement of Adult Intelligence* (3rd ed.), Williams and Wilkins, Baltimore, 1944, 258 pp.



PROFILE OF TEST RESULTS

Name Case No. 2 C.A. 9-0 Median M.A. 9-3 I.Q. 103

Order	Test No.	Name of Test	M.A.
1	13	Aud. Att. Syllables	13-6
2	10	Orientation	11-9
3	4	Verbal Opposites	11-0
4	8	Soc. Adj. A	10-6
5	6	Aud. Att. Words	10-0
6	12	Designs	9-6
7	15	Soc. Adj B.	9-3
8	2	Verbal Absurdities	9-0
9	17	Broken Pictures	8-6
10	11	Free Association	8-0
11	14	Number Ability	7-6
12	5	Motor Speed	7-0
13	9	Visual Att. Objects	6-6
14			
15			
16			
17			
18			
19			

DIAGRAM III

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form to date.[1] the California Test of Mental Maturity [2] has five levels from kindergarten to adulthood. It is divided into language and non-language abilities, and is subdivided into five factors. The Minnesota Tests of Mental Development were devised by Kuhlmann.[3]

Group aptitude tests. There are literally hundreds of group tests for various grades. One of the most complete is Thurstone's [4] *Primary Mental Abilities*. This battery consists of sixteen tests administered in three sessions, requiring two hours and thirty-three minutes of testing time, and one hour and eight minutes of practice time. There are seven relatively independent or uncorrelated factors as follows: Perception, Number, Verbal, Space, Memory, Induction, and Reasoning.

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[1] D. Wechsler, *Wechsler Intelligence Scale for Children*, Age 5–15, Psychological Corporation, New York, 1949, 113 pp.

[2] E. T. Sullivan, W. W. Clark, and E. W. Tiegs, *California Test of Mental Maturity*, California Test Bureau, Los Angeles, 1946

[3] F. Kuhlmann, *Tests of Mental Development*, Educational Publications, Minneapolis, Minn., 1939, 314 pp.

[4] L. L. Thurstone, *Primary Mental Abilities*, University of Chicago Press, Chicago, 1938, 121 pp.

The Detroit General Aptitudes Examination. An example of a group test for upper elementary grades and high school is the Detroit General Aptitudes Examination[1] with sixteen parts and requiring about ninety minutes to administer. It yields measures of intelligence, mechanical aptitude, and clerical aptitude. Ten parts are assigned to intelligence, with five of a verbal or language nature and five of a nonverbal type. Combinations of nine tests yield a measure of mechanical aptitude and another combination of nine a measure of clerical or commercial aptitude. It provides a wide basis of aptitude evaluation.

In addition to the Detroit General Aptitudes Examination, there is a series of Detroit Intelligence Tests ranging from kindergarten through the adult level, with the kindergarten and first grade available through the World Book Company, and the others through the Public School Publishing Company. Most of them have been standardized through long use in the Detroit Public Schools and they contain both verbal and non-verbal materials.

Other well-known tests include the series by Otis, the Pintner-Cunningham Test, the Pintner Verbal and Non Verbal Series at different levels, The Terman-McNemar Group Test, The American Council Psychological Examination, and some developed and used in test bureaus of large city school systems. There are aptitudes for music and art. Although the Rorschach Ink-Blot Test is designed primarily to measure aspects of personality, the mentallv retarded show distinctly characteristic responses.

General Versus Specific Abilities

One of the most perplexing problems in the analysis of intelligence centers around the question as to whether or not intelligence is a general factor or a series of specific factors relatively independent of one another. Although certain statistical methods, known as factor analysis, have been applied to the test results there is still a great difference of opinion about the constitution of abilities. Freeman[1] summarizes these points of view under three heads: Thomson and Thorndike consider general intelligence to be a composite of a large number of highly popularized abilities; Kelley and Thurstone consider intelligence to be composed of a limited number of primary mental abilities, each relatively independent of the others but with the sum of all being general intelligence; and the views of Spearman and Holzinger that there is one general factor, a limited number of group factors running through many operations, and a large number of very specialized factors, but with some question whether or not the general factor should be considered as general intelligence. Whatever is labeled general intelligence, it is a very important element in determining success or failure in life. There is probably less general significance to special abilities such as motor speed and precision, auditory attention span, or verbal ability.

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[1] H. J. Baker, P. H. Voelker, and A. C. Crockett, *Detroit General Aptitudes Examination*, Public School Publishing Company, Bloomington, Ill., 1938, 16 pp.

The Growth and Development of Intelligence

There has been much bitter debate and controversy over the development of intelligence and the influence which environment may have upon it. Some authorities believe that intelligence develops very rapidly in the early years of preschool life. Dearborn's conclusion to the contrary was based on what he believed to be poor standardization of intelligence tests for early ages. The upper limit of mental growth has been assumed to be at many different points with several authorities agreeing that it ceases at about fifteen years of age. The possible reasons for the limit of fifteen years lie in that much of the material in verbal intelligence tests reflect schooling and that by fifteen years of age the practical limit of such advance would be reached. A second reason is that beyond that age, mental interests become so diverse among individuals that no common body of testing materials would show appreciable

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[1] F. N. Freeman, "Intelligence: Its Nature and Nurture," *Thirty-ninth Yearbook, Part I*, National Society for the Study of Education, Public School Publishing Company, Bloomington, Ill., 1940, pp. 19–20.

gains, although individuals would gain in specialized fields. Dearborn and Rothney[1] devised a formula for a mental growth curve and conclude that there is some mental growth up to thirty years of age, with 2 per cent of average mental growth taking place after the age of twenty-one or twenty-two years. When the facts are finally determined it may well be shown that some phases of intelligence, such as area, will continue to develop with years of experience and that development continues for many years along certain lines with some individuals.

The nature of the growth curve for individuals appears to be different from that derived from the averages of individuals. In the mass norms individual variations of mental growth are lost since some may develop more rapidly at one time, and others at another, so that the curve remains fairly regular for the group as a whole. Longitudinal studies of individuals show variations in rate occurring at different times. Knowledge of these variations should be helpful in interpreting the progress of individual children through school. The causes of such variations are probably as mysterious as are the spurts in physical growth with which people are more familiar. The mental spurts may occur at the same time or at other times than the physical changes.

Before inquiring further into the nature of mental growth it is well to discuss the conditions during the examinations themselves. Trained psychologists are aware of conditions which may affect results, such as emotional blockings, lack of favorable rapport between examiner and child, language difficulty, slight hearing defect, eye defect, internal blocking of speech, and numerous other circumstances which might reduce the full effort and cooperation of the child. Obviously, if a child is blocked because of one or more of these difficulties in one examination, and is free of them in a second, his results will be higher. It might be assumed incorrectly that an accelerated rate of mental growth had occurred in the interim. Likewise unfavorable conditions at the second examination

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[1] W. F. Dearborn and J. W. M. Rothney, *Predicting the Child's Development*, Sci-Art Publishers, Cambridge, Mass., 1941, p. 231.

produce an opposite effect. In recognized clinics, psychologists are constantly on the alert for such variations, defer judgment on the first examination, and hence the phenomenal changes in I.Q. are not expected nor found.

Another source of variability lies in the inadequate standardization of norms on certain tests or on tests at certain age levels. The type of test material influences results, particularly the difference between verbal and nonverbal tests, the emphasis of some upon speed, and of others upon difficulty. Another difficulty lies in the tendency for tests of young children to be based necessarily upon rather simple instead of complex mental processes. Such materials, of a factual or memory type, are more easily susceptible to coaching or to the influences of good home environments. Whenever young children are placed in favorable environments results of intelligence tests tend to rise, but it is very doubtful whether this is a real rise in mental level or a spurious change due to the nature of testing materials.

The most complete discussion of the effects of environment were given in Parts I and II of the Thirty-Ninth Yearbook of the National Society for the Study of Education,[1] entitled *Intelligence: Its Nature and Nurture*, appearing in 1940. Most of the claims of the environmentalists are not so extreme as their opponents would imply, and possibly come within the normally expected variability in measurement, plus some of the conditions inherent in testing noted in the paragraphs above. It would certainly be a boon to psychologists if they could safely guarantee an increase of the I.Q. to higher levels by moving children into more favorable environments. If such rises were generally possible, they would long since have been discovered and practiced on a very extensive scale. Such has not been the case. Feeble-minded children continue to be found in very good homes, and very superior children continue to be found in homes of very inadequate social and cultural status.

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[1] National Society for the Study of Education, *Intelligence: Its Nature and Nurture, Parts I and II*, Thirty-ninth Yearbook, Public School Publishing Company, Bloomington, Ill., 1940, 409 pp.

Range and Distribution of Differences

In terms of general differences, individuals may be divided into several groups. While these classifications are based to some extent upon intelligence, many other factors such as personality, health, and cultural background enter into any well-planned classification for instructional purposes. The characteristics of the slow-learning and the rapid-learning will be discussed, although they continue to be enrolled in regular classes. They need modifications of curriculum and methods of teaching suited to their abilities. The other groups, including the gifted, the mentally retarded, and the institutional-feeble-minded should have special classes or groupings, with the last named in custodial homes

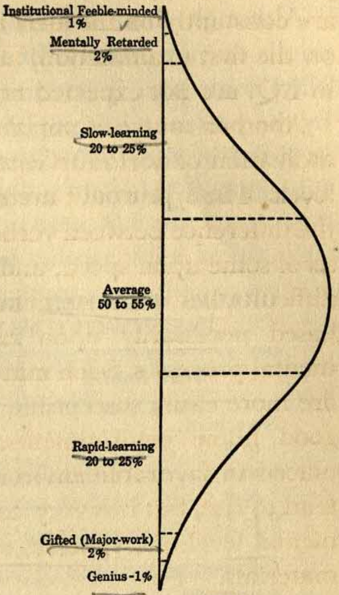

DIAGRAM IV
The Distribution of Intelligence

The distribution of these groups follows that of the well-known frequency distribution as per Diagram IV.

Distribution of Intelligence Groups

It will be noted that the average comprise from 50 to 60 per cent of the total, the slow-learning and the rapid-learning each comprise about 20 to 25 per cent of the total, 2 per cent for the mentally subnormal, less than 1 per cent for the institutional-feeble-minded, and about 2 per cent for the gifted. A genius group of 1 per cent might be distinguished at the higher end of the scale corresponding to the institutional-feeble-minded at the lower end. The percentages are approximate and there is not necessarily any clear-cut line between the various groups. Only rough, general limits are assumed.

Recent Grade Status of American Adults

Although there are many reasons besides mentality why pupils do not progress in school, lack of ability undoubtedly plays some part in successful education. The grades reached by the present adult population over twenty-five years of age, as listed in the 1940 Census, and reported in the National Educational Journal [1] are shown in Table XI.

TABLE XI

GRADES REACHED BY AMERICAN ADULTS OVER TWENTY-FIVE YEARS OF AGE, 1940 CENSUS

Grade Reached	*Number*	*Per Cent*
No school	2,799,923	3.8
1 to 4	7,304,689	9.8
5 to 6	8,515,111	11.4
7 to 8	25,897,953	34.5
9 to 11	11,181,995	14.9
12	10,551,680	14.1
College 1 to 3	4,075,184	5.5
4 or more	3,407,331	4.6
Not reported	1,041,970	1.4
Total	74,775,836	100.0

From this table 25 per cent reached only the sixth grade or less, with the average in the eighth grade. In interpreting this table it should be remembered that there are many adults over fifty years of age in whose youth education was not so universal as today. At best there are undoubtedly intellectual limitations why a considerable number attained only a mediocre education. Another school of thought would argue that lack of schools and limited economic status are chief reasons why people do not receive a more adequate education.

General Implications for Education

The recognition of the true nature and significance of intelligence has tremendous implications for education. In many ways it has brought a revolution in educational philosophy. Although many teachers recognize its import, others do not, and the public has not accepted the implications.

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[1] "Is an Eighth Grade Education Enough?" *Journal of the National Education Association,* 1942, **31,** p. 206.

It was a popular but erroneous concept that education increased the I.Q. and made children bright. This idea came from the fact that children who survived the rigors of several years of school and completed high school or college seemed to have been made bright by this process. Actually most of those who completed high school and college were bright, which was one of the chief reasons why they were able to be so successful educationally. It is quite well known now, although it was not recognized years ago, that such pupils were the more favored children mentally from the time they entered the first grade.

Beginning with the first grade the less favored mentally began to fail. In fact, it was common to have fully one-third of the first grade fail. Retardation was unusually heavy in the fourth and fifth grade, and failure to continue after the eighth grade was so common that the junior high school was set up with Grades 7 to 9 to bridge this gap. In failing the less favored group from grade to grade, the average of those who survived climbed higher and higher above the general average, and included chiefly those who were mentally superior or gifted. Frequently not more than 10 per cent of those who started in the first grade completed high school, and most of these were obviously of high mental caliber. However, there were probably a few of average ability but with good personalities and habits of study who remained among the number. It was an obvious but erroneous conclusion that the school experience had made those who survived, of high mental ability. Great belief and faith in the school was based on this concept that schools made children bright.

It is now necessary to face the long and hard task to recognize the true nature of ability and that the schools are not able to exercise any magical process by which children become more intelligent. On the contrary, it is necessary to evaluate children's abilities and plan an education suitable to these abilities. Such a system implies that every level of ability shall have a suitable curriculum. The rapid-learning and the gifted should have adequate programs, as well as the less favored.

Effects of Other Factors

In the preceding section attention has been called to a series of mental abilities for each individual as well as his general mental age, which encourages study of the total mental potentialities of each person. There are many other influences besides intelligence which affect success in school, in community life, and in vocational endeavors. Most of them are not measured by intelligence tests nor were such tests intended nor expected to measure them. However, when the tests do not explain all human behavior, novices in their use continue to condemn them as useless, or loudly proclaim their seeming inadequacies.

Among the various influences which affect the optimum functioning of intelligence are various physical and sensory ① defects. The chapters of Part II have described many types of physical disabilities and have shown how they thwart the natural development of intelligence. Many children with mild physical defects which may not have been discovered do not work up to the mental ability of which they are capable. A ② second general field of influence deals with the child's habits of work, arising from his early home background and training. A child of comparatively limited mental ability may capitalize his low I.Q. to good advantage if he is industrious or possesses good habits of work. The opposite condition also exists. There ③ is a third field of influence centering around personality, emotional life, and social adaptability which are not measured except very indirectly by intelligence tests. These factors are extremely important in determining success or failure in life.

There are two zones of influence arising from the home. One ① is the physical side of the home, the other is the home atmos-② phere. Even in the school program there are influences which cause it to correlate imperfectly with intelligence as witnessed by certain children of normal abilities who fail in some important subject such as reading. These cases will be discussed in Part VI.

The significance of these influences will be discussed in Part V which deals with problems of behavior maladjustment. It is no disparagement of the intelligence test when it does not measure all of these factors. In the early days of testing Terman warned that such abuses would occur, and they have occurred many times, although the real values of mental measurement have not been decreased. Intelligence tests are designed to measure one significant field of human qualities, and by measuring that field and taking its influence into account, a much more intelligent approach to factors other than intelligence which contribute to human progress may be made.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Give your own experiences with psychological tests.
2. Consult studies on the history of psychological testing such as is given in Peterson's *Early Conceptions and Tests of Intelligence.*
3. Give a list of radio programs and of newspaper and magazine features which emphasize materials allied to intelligence tests. How valid are they as true measures of intelligence?
4. Present a more detailed description of theories of intelligence by Thorndike, Thurstone, and others.
5. Prepare a list of intelligence tests, group and individual, and discuss the merits and qualifications of each.
6. Discuss any case you may have known in which other factors than intelligence have been very important in determining success or failure and give your own interpretation.
7. Discuss whether heredity or environment are more important in determining the development of intelligence.

Chapter XV

THE SLOW-LEARNING

As a group, slow-learning children are not ordinarily classified with the exceptional, since they exist in large numbers and no special classes are provided. They form a group midway between normal, average children and the mentally subnormal, but they are sufficiently different from the average to merit special study and discussion. Their plight has been somewhat similar to that of more distinct types of the exceptional in which the single child in one classroom failed to excite as much interest as the discovery, revealed by a survey of an entire school system, of how many cases were to be found in all classrooms. The slow-learning have tended to drift along with considerable failure and retardation. They dropped out of school as early as possible, and by leaving one at a time their absence was not particularly noticed. Since teachers of exceptional children should be alert to all reasons for maladjustment, the slow-learning should be included as a very important group.

Definitions of the Slow-Learning

Generally slow-learning children are somewhat below average in school achievement and general mental ability. They are higher than the mentally retarded whose problems will be considered in Chap. XVI. They include from 20 to 25 per cent of the school population, which compares in importance to the 20 per cent with vision defects. In terms of intelligence tests they range in I.Q.'s from 70 to 75 up to 90, but mental limits should not be too definite. Many of them have limitations in factors such as physical condition, personality, and in other areas. In spite of these minor deviations they pass for normal children, since such differences are comparatively small. However, the cumulative effects of these deviations over a period of years create problems of extreme maladjustment for the schools as well as for the pupils themselves.

Characteristics of the Slow-Learning

In a recent Yearbook of the National Society for the Study of Education on *The Grouping of Pupils* [1] a composite picture of the typical slow-learning child was prepared from various authentic sources, as follows:

> The dull child was probably a little late in learning to walk and likely a little slow in learning to talk. He was probably shy in making social contacts. His parents may have tended to push him to do things before he was quite ready.
>
> He probably started school at about the same time as the average or bright child but seemed somewhat immature. He adjusted himself to the school situation rather slowly and found it difficult to do first-grade work. As a result, he probably repeated the first or the second grade and then went on without any particular difficulty until the fifth or sixth grade, when again he was obliged to repeat a half year to a year. Although he probably was not interested in reading or at least found it difficult, and also sometimes had difficulty in arithmetic, he may have had certain fields of interest in which he did very well. Some years ago this type of person would have dropped out of school at the fifth or sixth grade unless there was great pressure on the part of parents or friends. Now he enters the junior high school and is offered work of a definitely non-academic character. Sometimes today he gets into the senior high school but fails miserably to do work on the college entrance standard. It is rare that he attempts to enter college. His school experience was discouraging and tended to make him feel the futility of effort.
>
> After finishing school, the work this slow individual undertakes is apt to be of the unskilled or semi-skilled type. It is sure to be routine and may be of a blind-alley type. He may make good advancement within a limited field if he has special ability and good personal qualifications. He probably belongs to the class of workers that changes jobs frequently. His income is variable. Very rarely will he get as much as $2,000 a year but part of the time he is likely to be without work of any kind. The slow person is apt to

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[1] National Society for the Study of Education, Thirty-fifth Yearbook, Part I, *The Grouping of Pupils*, Public School Publishing Company, Bloomington, Ill., 1936, p. 5.

> be restless in his social contacts, partly because of his low economic level. He will tend to follow blindly any offer of improvement even though it has no sound basis. Provided he has desirable personal qualities and fair economic security, he may appear to be among the stable, semi-skilled classes—a happy, thrifty citizen. It is rare that he shows any quality of leadership except in very small groups, and he often shows poor judgment in selecting his companions. He reads very little, possibly looking at the newspapers for funnies and the Ads. He goes to the movies of the cheaper variety. Chance may lead him into wholesome recreational groups, but just as likely he will be lead into groups which have an unwholesome influence.

There are enough suggestions in the above paragraphs to warrant a restatement of education if all needs of the slow-learning are to be adequately met. The slow-learning child is a much misunderstood child. He is often confused in the popular mind with the mentally retarded in schools where no special educational provisions are made. The slow-learning child has usually been exposed to competition with average or with rapid-learning children. The tempo is so fast that he does not accomplish as much as he might otherwise if allowed to proceed at his own rate and by suitable methods of learning. This situation is parallel to asking a novice at the piano to play at regular tempo pieces which only skilled pianists are able to do. It would result only in meaningless floundering, and in regular education for the slow-learning it does the same. By proceeding at a reasonable rate, with instruction suited to his needs, the musical novice as well as the slow-learning child have much better chances for ultimate success.

There are three important ways in which the slow-learning child differs from the average. Their cumulative, long-time effects, singly and in combination over a period of years, result in marked contrast between them and average children. These three factors are: (1) quantitative differences in intelligence; (2) qualitative differences in learning methods and in mental functioning; and (3) the effects of nonintellectual factors. Each of these will be discussed briefly.

Quantitative differences in intelligence. Although intelligence is not the only differentiating characteristic of slow-learning children, it is one of the most important. Because of its seemingly specific nature, it serves conveniently as a basis for description. As the term "quantitative" implies, the extent of differences will be presented and contrasted with the abilities of average children. It was mentioned in the preceding section that the I.Q. range for the slow-learning was roughly from 70 or 75 to 90. If the average I.Q. of this group were set at 83, the mental ages at various stages of chronological age would be as shown in Table XII.

TABLE XII

CHRONOLOGICAL AGE AND MENTAL AGE OF THE SLOW-LEARNING

Actual or Chronological Age		*Mental Age*		*Actual or Chronological Age*		*Mental Age*	
Years	*Months*	*Years*	*Months*	*Years*	*Months*	*Years*	*Months*
0	6	0	5	8	0	6	8
1	0	0	10	8	6	7	1
1	6	1	3	9	0	7	6
2	0	1	8	9	6	7	11
2	6	2	1	10	0	8	4
3	0	2	6	10	6	8	9
3	6	2	11	11	0	9	2
4	0	3	4	11	6	9	7
4	6	3	9	12	0	10	0
5	0	4	2	12	6	10	5
5	6	4	7	13	0	10	10
6	0	5	0	13	6	11	3
6	6	5	5	14	0	11	8
7	0	5	10	14	6	12	1
7	6	6	3	15	0	12	6

The mental ages in Table XII are derived by taking 83 per cent of the chronological age at each age level, by six-month periods from six months up to fifteen years of age. Relationships correspond to an I.Q. of 83. It will be noted from this table as well as from the ratio or I.Q. of 83, that in each six months of chronological age the slow-learning child progresses five months in mental age or makes five-sixths normal progress. By the time a baby has reached six months of age he has attained a mental age of five months, at the end of the first year he has reached a mental age of ten months. Progress at five-sixths the normal rate obviously does not indicate a severe amount of mental retardation. It approximates normal progress.

It may be noted from Table XII that there is a cumulative effect of slow progress from half-year to half-year so that the difference between chronological age and mental age gradually becomes wider and wider. This difference in rate exists from birth so that by the time the slow-learning child has reached six years of age, ready to enter the first grade, he is already retarded one year in mental age. The first-grade teacher immediately becomes conscious of this one-year retardation and concludes incorrectly that the slow-learning child must be very much retarded in mental growth as compared to the average child. When mental differences become the subject of such comparison it is time to forget the comparison and plan an education for the slow-learning child in terms of his own mental development. Looking upon the slow-learning child as hopelessly retarded is the worst possible kind of educational philosophy. A more constructive point of view should be maintained.

Qualitative differences in intelligence. Teachers and psychologists who have made firsthand observations of slow-learning children note certain qualitative ways in which their intelligence operates in addition to the lower actual level to which it has developed. Some of these trends will now be listed.

The slow-learning child tends to learn by comparatively simple mental processes. He needs a liberal amount of drill and repetition to fix this learning although such drill should be judiciously distributed; otherwise it becomes tiring, monotonous, and uninteresting. Whenever rich, associative processes of learning such as characterize the rapid-learning child are used, the slow-learning child becomes confused and taxed beyond his comprehension.

The slow-learning child prefers concrete and practical learning to the abstract or general. He is more interested in trying to solve problems than to study the rules which govern them. He is more interested in manipulating a laboratory experiment than in learning the theory of why such an experiment should be performed and what result should be expected.

He prefers short-time units and specific assignments to long-time units or theoretical assignments in which he must discover goals and objectives. Among these short-time assignments there should be a judicious amount of review so that the threads of the continuity may be clearly traced. The slow-learning child has comparatively limited powers of self-criticism and hence finds it very uninteresting to check his work for possible errors. In the author's *Characteristic Differences in Bright and Dull Pupils* [1] various other qualitative differences are presented and discussed.

Other types of differences. Further study of the slow-learning child discloses many other types of differences. Some are of a minor nature, although the total cumulative effect upon school progress is often quite pronounced. Contrary to popular opinion such a child is retarded in motor skill and muscular coordination. This characteristic is not true of every slow-learning child but it is true of the slow-learning as a group when compared to the average and the rapid-learning. In addition their general strength and physical stamina are a little below par and illnesses are somewhat more common than for the more favored groups. They lose more time from school, contributing further to their educational retardation.

As a group, slow-learning children lack some of the desirable personal and social qualities which are found in more favored groups. They have more unfavorable economic and social backgrounds although a few of them have excellent backgrounds.

Fortunately, every slow-learning child is not afflicted with all of the disabilities cited above. Any one of them may have a few minor deviations, but the combined effect of these few, operating cumulatively over a long period, is able to work havoc with his educational progress. Such characteristics should never be taken as a bill of complaint or a list of alibis for neglecting the education of slow-learning children. They have been listed for the purpose of helping teachers to face the realities of the slow-learning. Schools have always had slow-learning children and will have them in the future, hence a positive rather than a negative attitude is needed.

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[1] H. J. Baker, *Characteristic Differences in Bright and Dull Pupils*, Public School Publishing Company, Bloomington, Ill., 1929, 118 pp.

Problems in Teaching the Slow-Learning

It is timely to consider briefly the aims and objectives of education as applied to the slow-learning, problems in methods of teaching, and adjustments of the curriculum for an optimum education.

Aims and objectives. In Chap. I there were listed four main purposes of education as follows: self-realization, human relationships, economic efficiency, and civic responsibility. These purposes are noble and worthy in themselves but education finds it difficult to achieve them satisfactorily for the slow-learning. The slow-learning fall short of self-realization unless their education is suited to their abilities and limitations. They fail to realize good human relationships when faced with discouragement, and there is a lowered sense of civic responsibility. Economic efficiency has been denied them in a world of brisk competition in which there has been an oversupply of man power. The four objectives are worthy, but the problem is a challenge in the case of the slow-learning.

Methods of teaching. In the discussion of qualitative characteristics of the slow-learning it was implied that methods of teaching should be adapted to their characteristic mental qualities. Short and simple methods of teaching were recommended, judicious use of drill was suggested, and a better balance between the abstract and the concrete was indicated. Specialists in subject matter should outline detailed plans, different from the average and rapid-learning if maximum results may be secured for the slow-learning. Considerable progress has been made in some fields of subject matter.

Curriculum adaptations. More puzzling than differentiated methods of teaching are suitable curriculum adaptations. Conflicting points of view have been brought to light with the present knowledge of individual differences. In early days, when these differences were not recognized, the finishing point for the education of the slow-learning was usually a discouraging failure in the upper elementary grades. It is generally agreed that such a program is a most unfortunate type of finishing school. The problem of where the education of the slow-learning should terminate has not yet been settled and little is being done about it. The economic status of the family and how long the boy or girl is able to continue in school confuse the issue. Some policy should be determined.

The selection of courses suitable for the slow-learning has never been adequately settled. It is a question whether they should be allowed wide electives or be limited to a few subjects for better mastery of fundamentals. Materials which seem desirable should be couched in simpler terms so that they may be understood. Those who write textbooks for slow-learning children should be aware of these problems and do the task effectively. There has been hopeful progress, but much more remains to be done.

Bruner[1] and others have established some fundamental criteria for evaluating teaching and learning materials and practices. These criteria apply in a general way to all pupils, but are very helpful when adapted to the difficult curriculum needs of the slow-learning. They are discussed under the headings of philosophy, activities, content, and evaluation. Each of these are broken down into subtopics with specific demands or problems under each. Philosophy is discussed under social philosophy, educational philosophy, and principles of learning. Activities are considered under approach, pupil purposing, interests and needs, social values, reality, variety, and culminating activity. Content includes authenticity, utility adequacy and significance, and organization. Evaluation embraces purpose, variety, validity, areas of growth, and interpretation. These criteria provide a valuable framework for an adequate educational program.

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[1] H. B. Bruner and others, *What Our Schools are Teaching,* Teachers College, Columbia University, New York, 1941, 225 pp.

Problems of a Suitable Education

It is evident from the preceding discussion that there is important need for adapting curriculum and teaching procedures to slow-learning children. Whenever a careful study is made of these children, either individually in mixed classes or by entire classes, their needs are obvious. Unfortunately, these matters have not been considered the chief issues, particularly from the standpoint of school administration and general school policy.

Too often the main issue was believed to be a program of mental measurement in order to merely discover the slow-learning and the rapid-learning. The program of testing was inaugurated, valuable time was spent in scoring the tests, recording them upon the school forms, and comparing them with national or state norms. This practice satisfied curiosity about the mental status of certain children. When test results agreed with opinions, confidence in the tests and in personal estimates were both increased. When the tests were in disagreement with personal estimates, the former always suffered. Too often the entire problem went no further than this initial stage. This same process has also occurred in testing for vision and hearing.

A second step has sometimes been taken, particularly in large schools with slow-learning children being segregated from the average and the rapid-learning. It was believed that the segregation itself was the goal of the testing program. Segregation in and of itself is of no particular value unless suitable educational adjustments are made. A few experimental studies were made in which educational results of grouping were inconclusive. Practically no mention was made in these studies of attempts at curriculum adaptations or modifications of teaching methods. One would hardly expect any educational advantages for or against grouping under such conditions.

An objection was raised to grouping or segregation on the grounds that it was not democratic and that all children should have equal opportunity. From the early history of the slow-learning under conditions of mixed grouping there is a long-time record of discouragement and unfair competition many times greater than from any attempts of grouping for the purpose of solving their problems. Generally, competition is most effective when there is a fair chance of winning in one-half of the time. Proof may be found even in golf tournaments where players are carefully placed in foursomes with others equally skilled.

In the Ninth Yearbook of the Department of Superintendence of the National Education Association[1] more than five hundred superintendents answered questionnaires about policies of promotion, grouping pupils, and allied topics. They made very frequent mention of low-mentality and overage pupils as among the first concern, with need for a better program for superior pupils next in importance. The amount of failure proved to be a very perplexing problem, which was met in an unsatisfactory manner by changing from annual to semiannual promotions or vice versa. Approximately twenty different reasons were listed for the promotion of pupils to the next grade, including achievement, teacher's judgment, mental status, size, health, attendance, age, and personality adjustment.

Segregation of groups. In the same report arguments were presented for and against grouping pupils according to ability, with 1326 citations in favor and 867 against this practice on about twenty items. The most common objection centered around the idea that slow-learning children would become discouraged if they did not have the stimulus of the bright. A total of 173 replies in favor of grouping cited segregation as a means of encouraging the slow-learning by removing the superior whose achievements would unduly discourage them. It was evident that many of the objections were of a theoretical nature, not based upon actual experience. There was little mention of courses of study adapted to the abilities of pupils and with less mention about adapting teaching methods to the learning processes of pupils. Both of these issues are crucial reasons for groupings. Unless such adaptations are made there is little reason for ability grouping. If these purposes are realized without grouping, segregation as an end in itself is of little value.

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[1] Department of Superintendence, National Education Association, Ninth Yearbook, *Five Underlying Factors in American Education*, Department of Superintendence, Washington, D. C., 1931, pp. 17–180.

In spite of these limitations there is administrative demand for procedures, methods, and materials which would fit the educational program to the abilities of all pupils, and with coordination of all factors to this end.

No plan of segregation was ever advocated by psychologists as extreme as some that were adopted and later abandoned as being too drastic. The main purpose of segregation was flexibility so that pupils with various abilities could be brought together for mutual benefit. Segregation is for the purpose of making a more effective approach to children and their needs than would otherwise be possible. The psychologists whose tests are used as a basis of classification are seldom given a part in planning educational adaptations. School administrators looked to the textbook writers to provide suitable materials, but many of them have little firsthand contact with slow-learning children.

The Outlook

Although the educational literature of the past twenty years has been strewn with the wrecks of many testing programs, and with plans for grouping children, there has been much substantial progress in a better understanding of the whole problem. The grim disclosures about individual differences coming to light among the young men in the armed forces will probably teach a second effective lesson more potent than anything which may develop from studying children.

The best educational provision for the slow-learning will develop when the importance and true significance of the problem is understood, such as is true of the partially seeing, the deaf, and other physical handicaps. Since the slow-learning will continue to be taught in regular classes there will be less concentration upon their needs as a group than for such an extreme group as the blind. In the meantime they are the losers, particularly in the needless battle over segregation.

The Minor Nature of the Handicap

It should be emphasized that the slow-learning are only slightly handicapped. In mental development they progress at five-sixths normal rate, although that rate causes them to fall behind the average after a few years. This actual difference in mental age is mistaken for a marked difference in the rate of mental growth.

In the past the slow-learning tended to be hurried through school at a rate so rapid that they did not accomplish as much as they might have if it had been geared to their abilities. If this problem continues to be improved and adjustments are made in line with their abilities and interests, the slow-learning will live up to the expectation of their mental age and I.Q. and be approximately normal in school and in adulthood.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Were you enrolled in any school system which used psychological tests? What do you recall about them?
2. Were you aware of any classifications or adaptations? What did you think of them?
3. How would you modify your ideas in the light of more recent knowledge?
4. Consult educational references for reports on adaptation of subject matter to the slow-learning in the fields of your own teaching interests. How well are they adapted to the needs?
5. Discuss any cases in which the achievement of individuals was much beyond the expectation from psychological test results. What were the other factors in success?
6. Prepare a further list of characteristics of the slow-learning from various texts which are available.

Chapter XVI

THE MENTALLY SUBNORMAL AND THE FEEBLE-MINDED

Among all of the types of exceptional children the mentally retarded and feeble-minded have had much attention and study. Many small cities have had at least one special class for the mentally retarded when no classes for other types have been established.

General Classifications of Cases

In the earlier years of classification, elaborate pains were taken to divide the mentally retarded into many minute types, such as high-grade imbecile, low-grade moron, and the like. There were also general terms, such as "feeble-minded," "mentally retarded," and "mentally subnormal" designed to include all subtypes. At present in the Detroit Psychological Clinic the terms "mentally subnormal" and "mentally retarded" are used to designate children who are eligible candidates for the special classes provided by the schools. The term "feeble-minded" is reserved as a legal definition for children of extremely retarded mental status who are usually committed to state schools for institutional training and permanent care. There are certain definitions however, which continue in rather extensive use and will now be noted.

The Basis of Classification

In the early days of classification before the use of intelligence tests, definitions were made chiefly in terms of social adjustment. This practice had much to commend it since it involved observations of the practical adaptability of children and adults to social living. The Mental Deficiency Act of 1913 in England was stated along these lines as follows:

> The *feeble-minded* are persons in whose case there exists from birth or from an early age mental defectiveness not amounting to imbecility, yet so pronounced that they require care, supervision and control for their own protection and for the protection of others; or, in the case of children, that they by reason of such defectiveness appear to be permanently incapable of receiving proper instruction in ordinary schools.
>
> *Imbeciles* are persons in whose case there exists from birth or from an early age mental defectiveness not amounting to idiocy, yet so pronounced that they are incapable of managing themselves or their affairs, or, in the case of children, of being taught to do so.
>
> *Idiots* are persons so deeply defective in mind from birth or from an early age as to be unable to guard themselves against common physical danger.

Later definitions in England and elsewhere defined backwardness in terms of mental tests, either in mental age or in I.Q. In 1931 England's new classification included three groups in terms of mental age retardation: *mental defective* or those with mental ages below half of the chronological age or an I.Q. of less than 50, corresponding roughly to their earlier definitions of imbeciles and idiots; the *more retarded*, from one-half to seven-tenths of their chronological age or roughly in I.Q. from 50 to 70, which corresponded to their earlier group of *feeble-minded* or to the American term of "moron," originated by Goddard; there was also included a group known as *less retarded* with general limits from 70 to 80 in I.Q.

Ingram [1] proposed three terms which are rather similar to those used in Detroit with the term *feeble-minded* used in general for I.Q.'s below 50 and mostly sent to custodial institutions; the *mentally retarded* from 50 to 75 in I.Q.; and the *mentally backward* from 75 to 89. For the last of these groups the terms "slow-learning," "dull," or "Z-group" children are also commonly used.

The terminology of the special classes is not uniform and hence somewhat confusing. For many years the classes in

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[1] C. P. Ingram, *Education of the Slow-Learning Child*, World Book Company, Yonkers-on-Hudson, N. Y., 1935, 419 pp.

Cleveland were known as Moron classes by official title. In New York City they are designated as Ungraded, in Detroit classes for the younger children are designated as Special A, and for older children Special B, which does not disclose their true nature. All such classes are opportunities for mentally retarded children by whatever name they are known.

There has probably been some abuse in the use of intelligence tests, as the sole criterion of backwardness, by untrained examiners who mistook for mental defectiveness low scores because of language difficulty, hearing defect, speech defect, emotional upsets, and poor testing techniques. Other evidences of retardation are always used by trained psychologists as will be noted later.

Characteristics

There are many special ways in which the characteristics of the mentally retarded and the feeble-minded differ from normal or superior children. In the sphere of physical handicaps, discussed in Part II, there were many references to intelligence and in many of them a small percentage ranged down into the level of the mentally retarded. Routine medical inspection for physical and sensory defects among the mentally retarded shows an average of at least two other defects per pupil in the annual testing of the Detroit Psychological Clinic. Although many of these additional defects center around tonsils, adenoids, and teeth, there is also a wide distribution of all other kinds of defects. Undoubtedly these additional defects add to the educational retardation and lack of general physical stamina which is characteristic of the physically handicapped as a group.

Mental characteristics show many features unique to the mentally retarded. In addition to the gross retardation in terms of mental age there are many qualitative psychological ways in which they are backward, as follows: They show a tendency to stereotyped answers by repeating the same response to different questions; they lack powers of self-criticism; their powers of association are limited; they are unable to keep unusual instructions in mind, but return to traditional methods; they fail to detect errors and absurdities in statements and in commonplace situations; they tend to have concrete abilities rather than abstract; they have limited powers of reasoning, visualization, and similar mental traits. A well-trained psychologist is able to form a good estimate of the brightness or dullness of any individual from the type of responses without computing the actual I.Q.

Personality and social adjustments are important factors in determining the success or failure of mentally retarded children. In a group of forty-five defective delinquents Foulds [1] studied the dominant type of reaction to frustration, and found that the group tending toward hysteria were the least intelligent. Doll and McKay [2] found some social superiority of special class children as compared with institutional children when matched for age, mental age, and sex.

Greene [3] matched two groups of adjusted and nonadjusted institutionalized defective girls as to life age, test age, school achievement, and social conditions. The adjusted group had been in residence a year longer, had less neuropathic ancestry, fewer were committed because of behavior difficulties, and they showed less emotional dependency upon the home situation. The nonadjusted had more first-born, and latter-born positions with regard to sibling rank, had less well developed recreational interests, and showed more aggression in social situations.

Pollock [4] investigated the incidence of mental illness and found that it is more frequent among the mentally subnormal than among the general population. The rate declined as the degree of intelligence advanced. His findings probably indicate that mentally retarded individuals are overwhelmed by emotional frustrations whenever they become conscious of their limitations. It has also been noted elsewhere that many of the feeble-minded have various types of brain injury or disease which may also be a directly contributing cause of their mental illness.

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[1] G. Foulds, "Frustration Types among Mental Defective Juvenile Delinquents," *British Journal of Psychology*, 1945, **36**, pp. 29–32.

[2] E. A. Doll and B. E. McKay, "The Social Competence of Special Class Children," *Journal of Educational Research*, 1937, **31**, pp. 90–106.

[3] C. L. Greene, "A Study of Personal Adjustment in Mentally Retarded Girls," *American Journal of Mental Deficiency*, 1945, **49**, pp. 472–476.

[4] H. M. Pollock, "Mental Disease among Mental Defectives," *American Journal of Psychiatry*, 1944, **101**, pp. 361–363.

Quantitative differences in intelligence. If it is assumed that the mentally retarded make an average of two-thirds normal mental progress with an I.Q. of 67, the mental ages corresponding to various chronological ages are as shown in Table XIII.

TABLE XIII

CHRONOLOGICAL AGE AND MENTAL AGE OF THE MENTALLY RETARDED

Actual or Chronological Age		*Mental Age*		*Actual or Chronological Age*		*Mental Age*	
Years	*Months*	*Years*	*Months*	*Years*	*Months*	*Years*	*Months*
0	6	0	4	8	0	5	4
1	0	0	8	8	6	5	8
1	6	1	0	9	0	6	0
2	0	1	4	9	6	6	4
2	6	1	8	10	0	6	8
3	0	2	0	10	6	7	0
3	6	2	4	11	0	7	4
4	0	2	8	11	6	7	8
4	6	3	0	12	0	8	0
5	0	3	4	12	6	8	4
5	6	3	8	13	0	8	8
6	0	4	0	13	6	9	0
6	6	4	4	14	0	9	4
7	0	4	8	14	6	9	8
7	6	5	0	15	0	10	0

It is to be noted that mentally retarded children are seven years and six months old before they are five years mentally or at the traditional time for entrance to the kindergarten, and that they are nine years of age before the time for traditional entrance to work of the first-grade level. Actually, instruction on a reduced scale in reading should be started for these children at the chronological age of at least six or seven years so that they may not become unduly discouraged with their lack of progress.

Physical characteristics. In the early days of studying the mentally retarded great emphasis was placed upon unusual physical characteristics, since other modern means of diagnosis were not available. Many of these deviations were called the stigmata of degeneracy, which in itself indicated a poor philosophy toward them. As a group, they are of smaller stature than the average with some correspondence between lowness of I.Q. and size. However, there is known to be great overlapping between and among groups and with the average, so that any diagnosis based on size alone would be most hazardous. As a group they tend to have more physical deviations than the average, with asymmetry of the head and face, unusual size of the head either in the direction of being either large or small, crowded and poorly formed teeth, ears of many shapes, and various other unusual conditions. It would be exceedingly dangerous to make a diagnosis upon such bases alone since the mentally normal often have some such defects. In the case of the mentally retarded there are likely to be two or more of these abnormalities per child whereas the normal seldom have more than one.

Talking and walking are likely to be delayed in mentally retarded children. These delays should not be confused with speech defects from other causes or from orthopedic conditions. When not based on such causes they are additional symptoms of backwardness. Parents usually reverse the relationship and believe that backwardness is caused by retarded walking and talking.

Number of Cases

It is estimated that approximately 2 per cent of all children should be enrolled in classes for the mentally retarded. This number is an estimated total of one-half a million for the entire country. In 1930 there were 60,000 enrolled in special classes, but by 1935–1936 the number had increased to nearly 100,000. The most recent enrollment figures are slightly lower than this high peak, so that less than one-fifth have special class provision. Any city of from five to ten thousand general population with one thousand school children should have enough for a class of from fifteen to twenty pupils.

Of the more definitely feeble-minded children, incapable of much schooling in special classes, about 0.5 per cent should be sent to institutions. Many of these facilities are greatly overcrowded, with long waiting lists. The 1939–1940 report from the Office of Education showed 93,821 such children in institutions, but this number is far short of those needing commitment.

Boys outnumber girls about three to one in the classes for the mentally retarded. It is not known whether this ratio represents a real difference or whether regular schools are more likely to fail boys and report them for examination on account of more aggressive behavior. Many examining clinics have few girls nominated for examination. In institutions there are more nearly equal numbers of boys and girls. It is believed that more backward girls are sent for fear of sexual immorality if allowed to remain in the community.

Types and Causes of Mental Retardation

There are many causes of mental retardation. Some causes are hereditary and others are acquired, some of the latter being associated with conditions of birth. In parents' minds there is much confusion and resistance about the causes of mental backwardness, particularly among those who are normal themselves.

Cretinism. Hypothyroidism, or deficiency of thyroid activity, was listed as one of the causes of growth disorders in Chap. XI. Certain physical deviations were noted such as short legs and arms, short stubby fingers, square body proportions, short neck, protuberant stomach, and dwarfish size. In mental ability they are limited and classify among the mentally retarded with all degrees of backwardness represented, depending in part upon the degree of thyroid defect. Since the thyroid gland acts in a very important capacity to regulate nutrition, the growth and development of the brain are affected along with other portions of the body. There are mild forms of cretinism which produce a type known as cretinoids. Their bodily and mental limitations exist in a less extreme degree and those with minor variations merge into the normal or average types.

Mongolism. Another type of mental retardation is mongolism, so named for the possible resemblance to physical characteristics of the Mongolian race. Such individuals have an oblique slant to the eyes and eyebrows, the hair is scanty and wiry, the mouth is partly open with the large tongue protruding and marked by deep, irregular fissures, with the papillae frequently swollen. They range from low-grade mental types up through the mild or Mongoloid type. The lay person incorrectly assumes that they are some type of Oriental and does not know their true character. Many of them die in infancy, others develop walking and talking at a late age and grow to only about one-half of the usual size. They seldom reach the age of thirty, with the average age at death of fourteen years.

Failure of development is the chief cause of Mongolism. It is closely associated with exhaustion of reproductive powers of one or both of the parents, usually the mother. This parental condition is frequently found with advanced age for childbearing, but sometimes with generally weak physical conditions at an earlier age. In an early study by Lapage [1] three-fourths of the mothers of Mongols were between the ages of thirty-seven and forty-four, and in his summary of previous investigations 189 of 325 Mongols were the last born in their families. When there are several normal or superior children in a family who are growing up with great promise, it is a serious psychological crisis when the last born is a Mongolian who cannot live up to the otherwise fine mental reputation of the family. In other families the first born may be one of this type and hence a discouragement for expecting a family of normal children. This fear is not founded on fact since there is practically never a second child of this type found in the same family and seldom are there any other types of feeble-minded among the number.

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[1] C. P. Lapage, *Feeblemindedness in Children of School Age*, Manchester University Press, Manchester, 1911, 359 pp.

Birth injury causes. There are two kinds of birth injury which cause feeble-mindedness. They are injuries to the head during birth, and cerebral anoxia. Head injuries are due to the large size of the child's head and the smallness of the pelvic structure in the mother. The skull bones are pressed too severely either naturally or with the necessary medical assistance so that hemorrhages occur in the brain. Brain tissue is destroyed when the rupture is of major degree, and when it is minor, capillary hemorrhages occur which seem to have a general effect not easy to diagnose. In modern obstetrics great care is taken in advance of birth as to the possibilities of birth injury and in extreme cases the Caesarian method of birth by operation is performed.

Cerebral anoxia is a cause of feeble-mindedness which has been recognized in recent years. If the brain of the infant is deprived of oxygen for any reason and for any unusual length of time, deterioration of the brain tissue takes place very rapidly. There is a critical period during childbirth, before oxygen is furnished to the child's blood through his own lungs. If the birth is delayed on account of long and difficult labor, there is danger from anoxia. A second source of anoxia is the common practice of using various anaesthetics to ease labor pains and birth conditions for the mother. Such medication reduces the supply of oxygen in her blood and hence to the child before birth takes place. In investigations conducted by Dr. Frederic Schreiber[1] there is a fairly high correspondence between the use of some of these drugs and the mental condition of the child.

The various types of brain-injured children are very unstable in their behavior. Their reactions are erratic, uncoordinated, without inhibitions, and with little or no understanding of social behavior or of the impact of their actions upon parents, teachers, and classmates. These characteristics are supplemented by extreme verbosity, illogical reasoning, irrelevant responses, and an exaggerated and affected style of language. Strauss and Lehtinen[1] have summarized twenty years of study and experience with brain-injured children in a research monograph including interpretation of psychological characteristics. They have related their findings to improved techniques in the classroom teaching of these children.

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[1] F. Schreiber, "Mental Deficiency from Paranatal Asphyxia," *Proceedings, American Association on Mental Deficiency*, 1939, **44**, pp. 95–106.

Microcephalism. In microcephalism the head is extremely small and the brain is only about one-fourth of its usual weight. The brain fails to develop to its usual size and hence the skull does not have to grow to its usual size. It is often less than 17 inches in its greatest circumference with a receding forehead and generally "pointed" appearance. It is believed that some hereditary condition causes the imperfect development of the brain. Defects in the structure of the brain rather than its size determine the mental condition, since some microcephalics are bright, although the majority of them tend to be feeble-minded.

Hydrocephalism. Hydrocephalism is caused by an excess of cerebrospinal fluid in the brain and total cranial area, which causes the skull to grow to abnormal sizes, in some cases to as much as 30 inches in circumference. The upper part of the head appears balloon-shaped and with a very large forehead which makes the face seem very small by comparison. Many such children are bedridden and unable to walk or carry on any of the usual bodily movements of ordinary play.

There are various miscellaneous causes of feeble-mindedness such as paralysis, meningitis, and other conditions which result in destruction of brain tissue.

Hereditary causes. Heredity is probably one of the causes of feeble-mindedness, although exact statistical evidence on large numbers of cases does not appear in the current literature of the subject. A review of Goddard's 1912 study of the Kallikak family was made by Scheinfeld[2] who concluded that the basic data of the study were not well established. Doubts are cast as to the paternity of the early beginnings of the family line, and the possibility of environmental communication rather than biological transmission is discussed. The validity of the original data are also questioned since they do not correspond to the expected distribution of the recessive, feeble-minded-producing genes.

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[1] A. A. Strauss and L. E. Lehtinen, *Psychopathology and Education of the Brain-Injured Child*, Grune and Stratton, New York, 1947, 206 pp.

[2] A. Scheinfeld, "The Kallikaks after Thirty Years," *Journal of Heredity*, 1944, **35**, pp. 259–264.

The Rh, or Rhesus, gene of human blood was discovered in 1940 and this blood incompatability between father and mother is now believed by some investigators to be a cause of feeble-mindedness in children. Yannet and Lieberman[1] studied approximately 100 mothers of idiots and imbeciles who were inmates of the Southbury Training School and found that the incidence of the Rh negative mothers was significantly higher than in the control group or than would be expected from random selection. Other investigators have reported somewhat similar findings.

Studies by Strauss[2] and others on the differentiation between exogenous or brain-injured children and endogenous cases of hereditary feeble-mindedness should eventually furnish sufficiently accurate diagnosis so that hereditary trends may be determined more definitely than up to now.

Types by degree of defect. Many types of feeble-mindedness have been listed as to causes. As to degree there are three generally recognized classes; morons, imbeciles, and idiots.

Morons. The term "moron" was proposed by Goddard to describe the highest of the three general types of feeble-minded, since in the early days the highest group in England was known as the feeble-minded. A loose use of the term "feeble-minded" in America had come to apply to all three types, resulting in much confusion in terminology. As to educational possibilities, morons are generally suitable candidates for special-class training in day schools. Upon leaving school the higher ones should work up to the equivalent of upper elementary-grade levels. In the lower limit they vary from I.Q.'s of 50 to 60, and with upper limits from 70 to 75. In their adult mental age they range from eight or nine years to eleven or twelve years. Stability in personality and opportunity from good home backgrounds are important factors in determining success, in addition to mental abilities. A few of the more unstable types are not educable in special classes and from a social standpoint qualify for permanent custodial care.

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[1] H. Yannet, and R. Lieberman, "The Rh Factor in the Etiology of Mental Deficiency," *American Journal of Mental Deficiency*, 1944, **49**, pp. 133–137.

[2] A. A. Strauss and H. Werner, "The Mental Organization of the Brain-Injured Mentally Defective Child," *American Journal of Psychiatry*, 1941, **97**, pp. 1195–1203.

Imbeciles. The next lowest type of the feeble-minded are the imbeciles. In I.Q. they range from about 30 or 40 to 50 or 60 and in adult mental age from three or four years to eight or nine years. Some of the more stable ones at the higher I.Q.'s make fair progress in special classes, whereas the lower levels profit very little from formal schooling and more properly belong in custodial schools or institutions for permanent care. One of the informal methods of classification is their limited ability in language expression, which is restricted to short phrases, whereas the morons make use of simple, complete sentences. The idiots are limited chiefly to single words or to unintelligible mumblings.

Idiots. This group represents levels lower than the imbeciles and with no effective education in day schools. They are usually excluded from school and need the protection of a custodial institution. Parents are more attached to them than to any other types on account of the prolonged babyhood. They cite every slight mental activity as proof of normal mentality.

Within the custodial institutions these three classifications continue to be used but in special day schools or classes, "mentally retarded" is a more appropriate term. At the institutions they are further subdivided into high, medium, and low grade within each group and are graded into cottages or colonies accordingly. While visiting an institution the writer once stopped a quarrel between two inmates who were arguing over whether one of them was low grade or high.

Quantitative differences in intelligence. It is assumed that the institutional feeble-minded have an upper limit of 50 per cent normal mental growth on an I.Q. of 50. Many of them are much below this upper figure. At the age of six years their mental age is three years or less and obviously not high enough to attend school with profit. It is not until they are twelve years of age that a few of the better ones attain a mental age of six years or up to the traditional time for first-grade entrance. At this age the lack of mental momentum which accompanies such low I.Q.'s would not let them profit much if enrolled in a class for the mentally retarded. By the age of fifteen years they would progress only to seven and one-half years of mental age, which is not a practical standard for suitable schoolwork for children of such advanced chronological age.

History of the Mentally Retarded

The treatment of the mentally retarded has been one of the most grim chapters in human history. In savage tribes and in early eras of civilization the low-grade feeble-minded were often cast out to perish as being unworthy of the human race. In the Christian era in Rome a spirit of greater compassion was shown toward all types of deviates including the mentally retarded. In royal courts many of the jesters and court fools were recruited from these ranks, although it is difficult to believe that their antics could have been very entertaining. At times they were supposed to have the power of oracles, at others they were believed possessed of evil spirits.

As early as the beginning of the seventeenth century, a chateau to shelter unfortunates, including the feeble-minded, was begun by Saint Vincent de Paul (1576–1660). Locke in his *Conduct of the Understanding* had argued that learning came through the senses and that it should be accompanied by pleasurable sensations. He was followed by Rousseau, who believed that education must be based on a child's native instincts and capacities. These men directed the attention to children and their potentialities.

These ideas were put to practical use by a French surgeon, Itard, who attempted to educate the Wild Boy of Aveyron. This twelve-year-old boy had been found living an animal existence in the woods of southern France. Itard worked long and diligently, bringing some improvement. At first he thought that he was working with a normal boy, who had never shared civilized training, but he concluded eventually that this boy was an idiot. Although Itard became discouraged he found that idiots had traits and characteristics similar to other people, but existing in lesser degree.

The work of Itard was carried on by Seguin (1812–1880),[1] who established a school for the mentally retarded in Paris in 1837. His efforts were so successful that many other countries became interested. He came to the United States in 1848 and was associated with state institutions in several eastern states, becoming the practical founder of the modern era in the study of the feeble-minded. In his method he began with training the muscles, then the nervous system, then the senses, progressing to the development of general ideas, and finally to abstract thought and a grasp of moral principles.

Many well-known American educators became interested in the education of the mentally retarded. In 1842 Horace Mann visited European schools and advocated the establishment of special schools for the feeble-minded in America. Dr. Samuel G. Howe, whose pioneer work with the blind has already been mentioned, started a class for the training of idiots as early as 1837, and through his influence, authority was granted about 1850 to start the Massachusetts School for Idiotic and Feeble-minded Youth. Eventually the movement for state schools spread rapidly, and although many of them began with the idea of a training program for higher types of the feeble-minded, eventually they found it necessary to make provision for the custodial care of the low-grade feeble-minded as well.

It has already been noted that many public-school systems have established special classes, mainly for high-grade cases. The first of these was in Halle, Germany, in 1859, with many other European cities falling in line in the next few years. Springfield, Massachusetts, started the first class in America in 1897; Chicago followed in 1898, Detroit in 1903. Growth has been slow but steady and encouraging.

[1] M. W. Barr, *Mental Defectives: Their History, Treatment and Training*, The Blakiston Company, Philadelphia, 1904, 368 pp.

The history of the special class has been fraught with many difficulties. The early classes enrolled many types of problems, including the behavior child with a normal I.Q., the reading disability case, and the mentally retarded. The malbehaved had bad effects upon the suggestible minds of the mentally retarded and tended to nullify the teacher's efforts. At the other end of the scale the class had a small number of low-grade feeble-minded who are now known to profit very little from special classes. The parents of such children believed that the class was established for their special benefit and insisted upon their rights as taxpayers. Such cases became a great burden to the teachers who had to become nursemaids to them while trying to teach the rest of the class. In small cities these conditions still tend to exist, but in larger areas with special staffs for psychological measurement and methods of evaluating behavior and personality deviations, there is a better selection of candidates.

Current Problems

The exclusion of the low-grade case from the special class is one of the auxiliary problems which disturbs teachers and school administrators. In some cities there is a limited number of "custodial" classes where such children may be enrolled, with a much simplified program. In the main such children are better off at home if such classes are not available, since the continual strain of attempting something too difficult aggravates their limitations. In many states they are excluded from school under a general legal interpretation which authorizes education for those who are capable of benefiting. These low-grade cases may be divided roughly into three groups according to age and possibilities of being committed for custodial care. The first group is young children who are very immature in mental age and I.Q. They seem so babyish that parents believe they would never consider custodial care. It is comparatively futile to suggest institutional placement at this stage. The second group is in the middle ages of childhood, parents are slowly becoming more apprehensive about their possibilities. Some of them are willing to consider institutional placement. The third group are the adolescents who make trouble by trying to play with small children who are afraid of them. They also become a source of great embarrassment to their brothers and sisters whose friends are not too charitable about associating with them. At length the parents are driven to the commitment by this social pressure after many years of futile effort, accompanied by the breakdown of the mother's health from the unusual and unnecessary care which would have been provided through state facilities, and by demoralization of the home atmosphere.

It should always be remembered that the parents of very defective children develop unusually strong attachments to them because of their prolonged babyhood and their extreme dependency. Parents prefer to keep such children in their own homes rather than send them away to custodial schools or institutions. There is also a movement, gathering in momentum, among the parents of such children to become organized in order to force local school systems to make some educational provisions for them. False hopes are frequently raised that some medical or other discovery will transform these extreme defectives into normal children. The slight improvement brought about by the use of glutamic acid in the past few years is a case in point.

The Educational and Vocational Outlook

Most of the large cities are making extensive provision for the higher types of the mentally retarded than in former years. Small cities often establish classes for them before they make special provision for the physically handicapped. In Detroit there are several schools for older pupils housing up to three hundred boys. There are other centers for girls. Class time is divided about equally between the academic and the vocational subjects, with provision for health instruction, music, art, and auditorium. Within the past few years the programs financed jointly by the Federal Government and states for the rehabilitation of the physically handicapped have been expanded to include the mentally retarded and the socially maladjusted. These bureaus are beginning to function as their special staffs are being trained, and employment opportunities for such individuals are being surveyed.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Describe any case of feeble-mindedness with which you have come in contact.
2. Discuss the various definitions of mental retardation.
3. Make a report on the Vineland Maturity Scale and studies relating to its applications.
4. Make a detailed report on stigmata of degeneracy as reported in Scheidemann.
5. Report more fully upon the history of feeble-mindedness as given by Martin.
6. Visit special classes of various types for younger and for older mentally retarded.
7. Visit an institution for custodial care of the feeble-minded and have a clinical demonstration of cases.

Chapter XVII

THE RAPID-LEARNING

After considering the problems of the mentally retarded and the institutional feeble-minded it is a marked contrast to turn to the rapid-learning. As a group, they represent the opposite of the slow-learning who were discussed in Chap. XV. For many years the rapid-learning were the chief group that survived school failure and hence they were believed to be average. In the lower grades of the elementary school, where they had the average and the slow-learning in competition with them, the rapid-learning found schoolwork comparatively easy. They often developed poor habits of schoolwork. They were able to waste time and still do work of average quality. In high school and college the competition with those of equal ability became more difficult. There have always been some rapid-learning and mentally gifted who are industrious and hard working, so that the competition for the others became more severe. Those who did not possess such qualities got the reputation of being mediocre in life situations after they finished school. Most of this difficulty dated back to early school experiences.

Definitions of the Rapid-Learning

As a group they are placed between the average and the gifted. They include from 20 to 25 per cent of the school population. In terms of intelligence tests they range in I.Q.'s from 110 to 125 or 130, although no definite boundaries should be set in I.Q.'s. As a group, they tend to have better health than the slow-learning, they attend school more regularly, their personality adjustments are better, and generally they come from better homes. When all of these advantages were added to superior intelligence the rapid-learning have the potentialities of very good educational records. There will be some discussion in this chapter of ways and means of making the rapid-learning more efficient educationally.

Characteristics of the Rapid-Learning

In a recent Yearbook of the National Society for the Study of Education [1] on "The Grouping of Pupils" a composite picture of the typical rapid-learning child was prepared from various authentic sources as follows:

> The bright, or superior, child probably began talking earlier than usual and showed some special ability in putting sentences together to represent connected thought. He was likely to be very independent in learning to do things for himself. Probably this independence attracted greater attention from the parents, who in turn became oversolicitous and tended to make the child overdependent for a long time.
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> The bright child probably started to school at about the same age as average children, but could read a little before beginning. Generally throughout his school life he was considered an average student, making no failures through the course. He probably learned easily with little study and had some curiosity to find out about things he did not know. At times he appeared to be uninterested in school and may have caused some trouble because he was inattentive. Teachers may have said he could do better work but did not try. In the high school he did average or above-average work. He did his school work easily and got the impression he could succeed without much effort. He had the respect of his fellow pupils and became a leader in student affairs, school publications, etc. He showed some initiative in doing things outside of school, possibly building airplanes, making radios, etc. He probably was interested in athletics and possibly in music. He was interested in preparing for college. He may have continued in college and graduated or he may have been transferred to some other school, such as a technical school, and probably graduated. In any case he made about average or above-average marks.
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> Upon finishing college his interests led him to enter some profession or to prepare for an executive position. Although this superior individual may have started rather low, his progress was quite

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[1] National Society for the Study of Education, Thirty-fifth Yearbook, Part I, *The Grouping of Pupils,* Public School Publishing Company, Bloomington, Ill., 1936, pp. 4–5.

rapid, particularly if he had the necessary personal qualifications. His salary was probably in excess of $3000 a year.

The social contacts of such a bright person were probably varied. He may have manifested some interest in public affairs, sometimes being very critical of them; or he may have been engrossed in his own advancement and intolerant of other interests. He probably established a home, showed interest in social and economic advancement and desired to give his children every possible advantage. He may become a leader not only in local affairs but also in some organization of state or national scope. His reading interests were wide and he tended to become an active participant in recreations.

As in the case of the slow-learning there are three ways in which the rapid-learning are different from the average. These differences are of a minor nature but when their cumulative effects are added together and allowed to operate over a period ① of years they total up to quite marked differences between the two groups. They are as follows: (1) quantitative differences in intelligence, (2) qualitative differences in intelligence, and (3) ③ other factors, primarily of a nonintellectual nature.

Quantitative differences in intelligence. It was noted that the range of I.Q.'s for the rapid-learning were from 110 to 125 or 130. If an average of 117 is assumed to be fairly typical of the group, the various mental ages for various stages of chronological ages are as shown in Table XIV.

It will be noted from Table XIV that in each six months of chronological age there is a growth of seven months in mental age. This increase starts immediately from birth so that by the time the rapid-learning child is six years of actual or chronological age he is seven years old mentally. By the time he is twelve years of age he has gradually gained a second year so that he is fourteen years of mental age, and by the chronological age of fifteen he is seventeen and one-half mentally. These are rather important cumulative effects over a period of years although they are only seven-sixths in rate. By the time the rapid-learning child is ready for the first grade he is already one year accelerated up to seven years of age mentally. This seven-year mentality gives him a tremendous advantage over the average child and especially over the slow-learning

TABLE XIV

CHRONOLOGICAL AGE AND MENTAL AGE OF THE RAPID-LEARNING

Actual or Chronological Age		*Mental Age*		*Actual or Chronological Age*		*Mental Age*	
Years	*Months*	*Years*	*Months*	*Years*	*Months*	*Years*	*Months*
0	6	0	7	8	0	9	4
1	0	1	2	8	6	9	11
1	6	1	9	9	0	10	6
2	0	2	4	9	6	11	1
2	6	2	11	10	0	11	8
3	0	3	6	10	6	12	3
3	6	4	1	11	0	12	10
4	0	4	8	11	6	13	5
4	6	5	3	12	0	14	0
5	0	5	10	12	6	14	7
5	6	6	5	13	0	15	2
6	0	7	0	13	6	15	9
6	6	7	7	14	0	16	4
7	0	8	2	14	6	16	11
7	6	8	9	15	0	17	6

child who is only five years in mental age or two years behind him. As a result, he can usually read before starting school or at least he progresses very rapidly in reading once he starts in the first grade. There is a general conclusion which has been mentioned before that the rapid-learning child may not work up to his expected mental capacity if he competes only with the average or the slow-learning. To some extent he is as educationally neglected as the slow-learning child because his capabilities are not fully capitalized.

Qualitative differences in intelligence. As in the case of the slow-learning there are certain characteristic qualitative mental factors of the rapid-learning which are worthy of mention.

The rapid-learning are capable of abstract reasoning to a much greater degree than is true of average and slow-learning children. Reasoning may be defined simply as a mental process which would otherwise have to be performed by trial and error. Reasoning becomes a great timesaver in the learning process. Since there are likely to be errors in a process which is purely mental, it is very important that the rapid-learning be trained in careful methods of reasoning so that their deductions may be correct and logical.

A second main characteristic consists of the ability to emphasize abstract rather than concrete learning. The rapid-learning child is more interested in learning how problems are to be solved than in their actual solution. He frequently finds it necessary in his rapid strides in abstract learning to sample concrete situations so that the steps in the abstract may be kept clear and distinct. There is always the danger that the rapid-learning will deteriorate into abstract thinking only, and lose scientific and specific attitudes toward their problems. One frequently sees rapid-learning children who have become very shallow, erratic, and illogical in their schoolwork, much below the high standards of which they are capable.

The rapid-learning are characterized by versatility in the use of their mental processes. Richly associative processes are natural for them in such matters as recalling names of persons, various incidents, and many other types of experiences. When one mental process does not secure the desired result, another is quickly brought into play and, if necessary, several others are called in turn until the correct answer is found. This kind of learning is time-consuming and is frequently mistaken for lack of attention. Rapid-learning children tend to take greater interest in school and in learning generally if they are encouraged to use such methods. It enables them, later on in life, to make correct solutions of problems in industry and business.

They prefer long-time units of work with large returns to short, specific units with small returns. As they grow older their schoolwork takes on more long-time tasks which they are able to use with great profit. They easily plan for some project which involves several different school subjects including those of the regular classroom, the science laboratory, the shop, and the auditorium. In a certain sense their entire school history is a long-time project, leading to a vocation with the election of suitable courses in high school and college. Such planning challenges their superior powers and motivates their schoolwork in desirable and fruitful ways.

There are other phases in which the mental processes of the rapid-learning differ from those of the average and the slow-learning. All of these should be taken into account and applied in the subjects which are offered to them in school. In any event, it is logical to expect equally good results from the various mental groups if they are all subjected to the same teaching methods and courses of study.

Other differences. In addition to the quantitative and qualitative differences there are other qualities of a non-intellectual nature in which the rapid-learning are more highly favored. As a group they enjoy better health, have better physical stamina, and attend school more regularly. This regularity of attendance stimulates interest and multiplies their chances for success.

They tend to have better qualities of a social nature and hence they get along more agreeably with their classmates and teachers. The secret of this advantage lies in their genuine interest in the affairs of other people. They do not live selfish and self-centered lives. In the main they come from homes of better than average social standing, and the culture from such background strengthens the other advantages which they have. There are some rapid-learning pupils who do not have such home advantages but when given opportunity in school rise rapidly to these socializing levels.

Unfortunately there are a few of the rapid-learning who do not possess all of these favorable qualities, such as good health and desirable personalities, generally characteristic of their group. Whenever schools fail to offer such cases the most suitable type of education, there is a great loss of man power and potential ability.

Problems in Teaching the Rapid-Learning

There are several problems in the most effective education of rapid-learning children. Although such children are enrolled in regular grades, it is desirable that teachers of the exceptional as well as the regular be aware of their characteristics.

Aims and objectives. At this point it is desirable to refer again to the four main purposes of education as follows: self-realization, human relationships, economic efficiency, and civic responsibility. These purposes are much more likely to be realized in the case of the rapid-learning than in other groups. Actually these objectives are rather natural for the rapid-learning but have been set as the general goals for all pupils. Not all of the rapid-learning achieve them as highly as they might, and this failure is one of the challenges to education.

Curriculum adaptations. It is fully as important that rapid-learning children should have a suitable curriculum as it is in the case of other groups. Since they are able to master the course of study for average children easily it is too frequently assumed that such a curriculum is sufficient and satisfactory for them. As a matter of fact they may be more neglected educationally than slow-learning children, whose limitations are so obvious that the schools necessarily must make some modifications to meet their needs.

There have been two conflicting points of view about what types of curriculum adaptations are most desirable. One proposal is that rapid-learning children should be advanced more quickly through the schools by extra promotions, and by merely taking the average program. This practice would advance them through school more rapidly and since many of them will continue into college and professional schools, the time which would be saved in the early grades would be used to good advantage later. Whenever no other provisions are made for them, the rapid-learning children tend to make this adjustment more or less automatically.

The second type of adjustment consists of enriching the curriculum in all of the subjects and throughout all the grades. It is possible to enrich the subject of reading in the first grade by offering many primers and first readers for mastery of reading fundamentals. There are many possibilities of enrichment and culture when several books are read at this level. Similar practices are feasible in all subjects and with great benefit to active and richly associative minds. By such enrichment the rapid-learning do not become so far advanced beyond others equally young, particularly at the period of adolescence. In these modern times when the education of the rapid-learning must be suited to a diversified and complex world, enrichment rather than acceleration has many points in its favor.

The problems of selecting a suitable curriculum for the rapid-learning are not so acute and puzzling as for the slow-learning. Most of them finish high school and many attend college, and these schools themselves are enrichment. A liberal policy of electives offers many advantages in enrichment.

Problems of segregation. It is obvious that the rapid-learning derive the most benefit when segregated by themselves and without being slowed up by the less favored groups. Wherever such grouping has been made a greater amount of enrichment actually takes place. Under segregation they have better opportunity to develop good habits of study and opportunity to work up to their mental powers. Wherever classes are so small that a group of them must be mixed up with the average and the slow-learning, it is possible to provide enrichment by giving them supplementary assignments. However, it requires constant attention and emphasis upon their needs to make such a program effective. In the usual type of mixed or heterogeneous class they do not get all the attention that they merit.

The chief problem in the education of the rapid-learning does not center around the question of segregation but rather around suitable curriculum adaptations and methods of instruction. Whenever these practices are brought up to most efficient levels, either with or without segregation, the problem of grouping will become a matter of minor administrative importance.

The Challenge of the Rapid-Learning

Since leadership in many important professions and positions in business and industry are filled from the ranks of the rapid-learning it is desirable to plan an education suited to their needs, abilities, and interests. The development of the fourth educational purpose of civic responsibility is one of the greatest needs in American democracy. It is highly desirable that this important group of the population keep a reasonable balance between this aim and that of pursuing selfish economic interests to the neglect of the former. The solution of this problem is the direct responsibility of education.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Relate and discuss your experiences with rapid-learning children.
2. Do you believe that the rapid-learning generally work up to the level of their mental abilities?
3. Discuss the advantages and disadvantages of segregating rapid-learning children. What evidence can you cite to prove your point?
4. Should the rapid-learning be informed about their good abilities and if so, in what terms should they be stated and at what age?

Chapter XVIII

THE MENTALLY GIFTED

In the preceding chapter many ways were shown in which the rapid-learning excelled the average and slow-learning. They include from one-fifth to one-fourth of the school population. In the present chapter the characteristics and problems of the upper 2 per cent will be presented. They represent the highest group, just above the rapid-learning or mentally superior.

The question is often raised as to why gifted children should be discussed in a book on exceptional children since they do not appear to be handicapped. As a matter of fact their exceptional abilities are so often unrecognized and their talents wasted that they are among the most handicapped of all groups, and hence they qualify for consideration among other types of the exceptional.

Definitions of the Gifted

There are many approaches to a satisfactory definition of the gifted. Even the term "gifted" is undesirable in some respects since it suggests special privilege, which is not the real philosophy behind their education. In Cleveland, a more satisfactory term of "major-work" classes has been adopted to indicate that they are capable of comprehensive assignments and of more responsibility. In the beginnings of a similar program in Detroit the same term is being used.

There are various bases of selection which should be taken into account. One of them is rating on intelligence tests. Most of the classifications set as a lower limit an I.Q. of either 130 or 140, with only about 1 per cent falling in this rigid classification. Such a strict classification might easily exclude types of special abilities such as music, art, and allied subjects whose potentialities are not measured directly on the intelligence tests. Selection on the basis of an intelligence test only would tend to segregate individuals with a high type of verbal fluency, although some of the more recent psychological tests have much wider bases of testing than verbal ability.

A more recent example of selection which includes ten factors was used by the writer as chairman of a committee to select major-work candidates in several Detroit schools, as follows:

1. General behavior
2. Effort as related to ability
3. Group intelligence rating
4. Rating of age for grade
5. Height ratio for age
6. Weight ratio for age
7. Rating for comprehension in reading
8. Rating on recent scholastic marks
9. Rating on number of permanently erupted teeth
10. Rating for participation in school activities

In 4 elementary schools all the pupils from Grades 1 to 8 were rated on this 10-item scale and within each item there was a 5-point scale from very poor to very good with ratings on approximately 2500 pupils.[1]

After each of the 10 items had been rated the total score was computed for all pupils with a range of from 10 or lower to 45 or higher out of a possible 50 points. Great interest was expressed by teachers, not only in the highest cases, but in the results for all children down to the lowest in score. It was decided to make a first rough selection of the upper 5 per cent in total score for major-work classes. In the 4 schools the minimum total score for this selection ranged from 37 to 39 points. Individual cases below these levels were considered, and a few accepted for trial. In general, all-round abilities were represented in this process of selection, and without undue emphasis upon intelligence which became only one factor of ten in the scale. As the work progressed, various children of high I.Q. but with unstable and antisocial trends who did not qualify at first were gradually assimilated into the classes.

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[1] For details of this rating plan, see Appendix.

Characteristics

There have been many popular misconceptions about the characteristics of gifted children. In the lay mind a theory has been developed that there must be compensations for most deviations in life. In the gifted, if the intellect is unusually high, the physique, personality, and other qualities must be low. While there are a few individuals of high ability who show these tendencies, the predominant trend is just the opposite, and the gifted are well endowed in many fields.

Physical development. More than fifty years ago Sir Francis Galton [1] had noted that while there were exceptions, as a group, men of great intellectual achievement were "a feast to my eye; being as they are, such massive, vigorous, capable-looking animals." In a study of their development, Mean [2] found that they learned to walk about one-half month earlier than average children and talked about three months earlier than average. While there is overlapping with other groups, there is a strong tendency for the gifted to excel all other groups in height and weight. In the most comprehensive studies of gifted children by Terman [3] in *Genetic Studies of Genius*, they were generally superior to all other groups in practically all physical traits such as breathing capacity, width of shoulders and hips, strength of muscles, and grip. All studies point conclusively to the fact that mentally gifted children are also superior in most physical characteristics as well.

Personality and social characteristics. As a group gifted children excel average children in practically all personality and social characteristics, with 70 per cent of the boys and 72 per cent of the girls exceeding in all traits combined according to Terman. It is also recognized that a few gifted children have very selfish interests and pursue them for their own personal ends. Such cases easily make a great amount of trouble since they use their unusual powers in that direction. Generally the gifted represent very desirable factors. They seem to realize that they will promote more progress and good will by pleasant rather than unpleasant ways. They are able to live in an abstract world in which they merge themselves and enjoy the drama of life around them instead of being absorbed in their own affairs. They like to show an interest in other people's lives since they learn new points of view with which to compare their own. This trait makes them interesting to others since they do not seem to be self-centered.

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[1] F. Galton, *Hereditary Genius*, D. Appleton-Century Company, Inc., New York, 1891, pp. 331–332.

[2] C. D. Mean, *The Relations of General Intelligence to Certain Physical Traits*, Teachers College, Columbia University, New York, 1916, 117 pp.

[3] L. M. Terman, *Genetic Studies of Genius*, Vol. I, Stanford University Press, Stanford University, Calif. 1925, 648 pp.

TABLE XV

CHRONOLOGICAL AGE AND MENTAL AGE OF THE GIFTED

Actual or Chronological Age		*Mental Age*		*Actual or Chronological Age*		*Mental Age*	
Years	*Months*	*Years*	*Months*	*Years*	*Months*	*Years*	*Months*
0	6	0	8	8	0	10	8
1	0	1	4	8	6	11	4
1	6	2	0	9	0	12	0
2	0	2	8	9	6	12	8
2	6	3	4	10	0	13	4
3	0	4	0	10	6	14	0
3	6	4	8	11	0	14	8
4	0	5	4	11	6	15	4
4	6	6	0	12	0	16	0
5	0	6	8	12	6	16	8
5	6	7	4	13	0	17	4
6	0	8	0	13	6	18	0
6	6	8	8	14	0	18	8
7	0	9	4	14	6	19	4
7	6	10	0	15	0	20	0

Intelligence. In most of the investigations gifted children have been selected on the basis of psychological tests and hence the intelligence has been of a highly selective character. In many classes the minimum I.Q. is 130 points, in others it has been 135 or 140. The upper range of I.Q.'s sometimes reaches 200. However, there are qualities other than verbal or abstract intelligence which are to be considered in gifted children.

The mental ages corresponding to their chronological ages are shown in Table XV for an I.Q. of 133.

In Table XV it is assumed that the mentally gifted make one-third additional mental progress over the average child, or an I.Q. rate of 133. It will be noted that at the age of four years they are already beyond the mental age of five for entrance to the kindergarten, and that at four and one-half years they are six years mentally. Their gain continues at the same rate so that by the time they are fifteen years old they are about twenty years old mentally, and some of the more advanced are much higher.

Number of Cases

The number of cases of the gifted is determined by the limits set in various plans for selection. If an I.Q. of 130 is the lower limit, according to Terman only about 1 per cent are included. If the lower limit is an I.Q. of 120, approximately 6 per cent are included, which was the estimate in the White House Conference. In the Detroit experiment in major-work classes 5 per cent were selected according to the process noted in an earlier section. Naturally, higher qualifications result in a more selected group. On the other hand, even with a group representing 5 or 6 per cent of the total, each individual usually has some phases of specialization which make his contributions acceptable to the rest of the group.

If approximately 5 per cent were selected, every school of a few hundred pupils has enough for one or more classes with special projects at three or four different grade levels and with ages fairly homogeneous in each. Various projects for such special groups will be presented later.

It has been noted in practically all types of exceptional children that the number of boys exceeded the number of girls. In the case of the gifted the boys now have their turn with more boys than girls. As a group, there have been many more eminent men than women, which may have been due in part to greater opportunity. In Terman's studies the ratio was approximately 11 to 10 in favor of the boys, after allowance was made for the ratio of 106 to 100 in the number of boys born.

Causes and Backgrounds

The same principles of heredity which applied in the case of the feeble-minded seem to apply to those of gifted abilities. There is a preponderance of gifted children with parents above the general level of ability as measured by the occupational status of their fathers. In Terman's[1] study, 31.4 per cent had fathers in the professional group and in Cattell's[2] study of eminent men 43.1 per cent of fathers were from that group. Half of Terman's group were from semiprofessional and business occupations, 11.8 per cent from skilled labor, 6.6 per cent semiskilled to slightly skilled labor, and only 0.13 per cent were from common labor. Although the numbers may be small, there is a possibility of gifted ability being found in homes of the lowly. Sir Francis Galton found that 977 eminent men had 535 relatives of equal eminence, whereas an equal number of average men would have only four such eminent relatives. From these studies it is evident that heredity plays a very important role in gifted children and adults.

From the statements just cited it has been noted that a substantial majority of gifted children come from homes of a professional or near-professional status. These homes provide not only a favorable heredity, but an equally favorable environment in which the children may flourish. Books, magazines, travel, friends, and associates all contribute to their culture. The challenge to the gifted is that they shall live up to what heredity and environment offers them and in turn contribute to the welfare and advancement of society in leadership, inventions, and general advancement.

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[1] L. M. Terman, *Genetic Studies of Genius*, Vol. I, Stanford University Press, Stanford University, Calif., 1925, p. 64.

[2] J. McK. Cattell, *American Men of Science*, The Science Press, Lancaster, Pa., 4th ed., 1927, 1132 pp.

History of the Gifted

History is filled with the names of men gifted in different lines—government, sciences, literature and the arts, and all other lines of worthy endeavor. History is largely a recital of their achievements and in it more emphasis should be placed upon the influences which they have had upon the world of their day and later generations. In *Genetic Studies of Genius*, Vol. II, Cox[1] gives very illuminating accounts of the early mental traits of three hundred geniuses, from which psychologists attempted to establish their I.Q.'s by evaluating the available data. Eminent men in many fields were discussed and generally were shown to be of high abilities in early childhood. Many musicians composed creditable music in early childhood, and likewise some very fine literature was produced in childhood years. Among these men were Mozart, Beethoven, Rembrandt, Michelangelo, Tennyson, Emerson, Sir Walter Scott, and others.

From an educational point of view the selection of gifted individuals has attracted the attention of great leaders. In ancient Greece, Plato advocated the use of a series of tests to discover the talented of his country and to train them in accordance with their superior abilities. They were to be trained in science, philosophy, and metaphysics so as to become future leaders of the state. He believed that Greece could continue only as long as such a course were followed. At a later time noted teachers from enslaved Greece were used as tutors for the sons of Roman nobility.

The most marked example of selecting gifted and superior individuals for government positions was by Suleiman, the Magnificent, ruler of the Ottoman empire in the sixteenth century. At regular intervals he sent emissaries throughout all parts of the empire, not only among the Turks, but among conquered peoples as well, and selected the most promising youths. They were trained in the Mohammedan faith and were developed as leaders in war, religion, art, and science.

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[1] C. M. Cox, "The Early Mental Traits of Three Hundred Geniuses," *Genetic Studies of Genius, Vol. II*, Stanford University Press, Stanford University, Calif., 1926, 842 pp.

During the reign of Suleiman, he threatened to conquer all of the world and for centuries afterward his empire continued as a great power.

In preparation for World War II, Hitler followed this practice with mentally superior young Germans who specialized on every phase of life in all countries of the world, both by study from books and by travel, so that military conquest might more easily be achieved. The deadly effectiveness of such information was amply proved in the early years of the war. Other nations might well take a leaf from such practices but devote them to goals more acceptable to democratic living.

The Columbia University Conference. On December 13 and 14, 1940, a conference of Education for the Gifted was held under the auspices of Teachers College, Columbia University, in honor of Leta S. Hollingworth. Papers were presented by Dean Russell, E. L. Thorndike, Herbert Bruner, and others upon various phases of the education of the gifted. The meeting attracted a large number of educators from all parts of the country. A summary of this conference appeared in the *Teachers College Record.*[1]

Development of classes. There were many efforts to provide some special educational opportunities during the latter part of the nineteenth century. In 1867, William T. Harris, Superintendent of Education in St. Louis, introduced a more flexible plan of advancement, giving promotions at the end of five-week periods instead of annually. The Elizabeth plan, the Cambridge plan, the Santa Barbara plan, those of Batavia, San Francisco, and other cities provided for more flexible grading, resulting mainly in the rapid acceleration of gifted pupils through the grades. The first gifted class was a kind of "preparatory school" in Worcester, Massachusetts, in 1901. Children in Grades 7 to 9 who were in good health and of high scholastic standing were allowed to take some high-school subjects such as algebra and foreign languages. These classes have been in continuous operation since that time and with several hundred children enrolled. Whipple[1] reported on some experimental classes under his direction while he was teaching educational psychology at the University of Illinois. Bruner[2] organized classes for the gifted, the rapid learning, and the slow learning in 1918 at Okmulgee.

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[1] "Education for the Gifted," *Teachers College Record,* 1941, **42,** No. 5, pp. 375–460.

The modern period of special classes began about 1920 with programs in Cleveland, Los Angeles, and Rochester, New York. Los Angeles had experimented with classes a few years earlier. The movement has not had a very encouraging history. In 1930 Heck[3] reported that only 30 of 762 cities over 10,000 population had any such classes or schools, and since his report covered 96.6 per cent of all such cities the report on the gifted was somewhat discouraging. The United States Office of Education furnished a table of statistics in 1947–1948 which showed fewer than 21,000 gifted students enrolled in special classes for the elementary and secondary schools, with over 90 per cent of them in the classes in New York City.

Development of Suitable Programs

Acceleration, segregation, and enrichment are three types of adjustment which may be made for gifted children. There are possible advantages and disadvantages in each of them.

Acceleration. If no special provision is made for gifted children, they are likely to be double promoted or to enter school at an earlier age so that they become accelerated ahead of children of their own age. If no other provision is made, acceleration takes place as a natural phenomenon. There is some danger that gifted pupils who are accelerated will absorb only the intellectual phases of subject matter without much realization of their social, political, and economic values. Terman and Oden[4] divided the gifted children of their study into two groups according to acceleration and nonacceleration, which disclosed the fact that in most respects the accelerated group showed slight excellence over the nonaccelerated group. They concluded that the risks of moderate acceleration were not as great as commonly believed.

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[1] G. M. Whipple, *Classes for Gifted Children*, Public School Publishing Company, Bloomington, Ill., 1919, 151 pp.

[2] H. B. Bruner, *The Junior High School at Work*, Teachers College Contributions to Education, No. 177, Columbia University, New York, 1925, 111 pp.

[3] A. O. Heck, *Special Schools and Classes in Cities of 10,000 Population and More in the United States*, Government Printing Office, Washington, D. C., pp. 20–21.

[4] L. M. Terman and M. H. Oden, *The Gifted Child Grows Up*, Stanford University Press, Stanford, California, 1947, 448 pp.

Segregation. Except for a few large cities, there is no large scale segregation of gifted children into special classes. The city of Cleveland has one of the best organized systems of classes for the gifted which has functioned successfully for more than thirty years. It has been Cleveland's experience that most of the theoretical arguments against such classes do not materialize in actual practice. Their pupils find many advantages from associating with classmates of similar mental and social interests in an atmosphere of freedom which is much more difficult to develop in a heterogeneous class.

In high schools there is some approximation to segregation in the selection of the various curriculums. The college preparatory curriculum has very high standards which tend to eliminate many of the less able students. The general course often appeals to pupils whose economic means are very limited although their intellectual abilities do not always follow the same lines. In the Detroit junior high schools (called intermediate), there are often as many as ten or more sections or classes within each half grade. The highest section is essentially a gifted group although it may bear only a home-room number so as not to indicate its true nature. In a recent publication, Witty[1] states that sufficient data are not available to warrant an unqualified endorsement of segregation. He mentions possible conceit upon the part of the pupils, overwork, and the inability to mingle satisfactorily with the rank and file of children as factors in his belief.

Enrichment. Enrichment provides many opportunities for gifted children without some of the possible disadvantages of acceleration or of segregation. Through supplementary assignments and additional materials, it is possible to provide unlimited opportunities. Unless some reasonable limits are placed upon enrichment, gifted children may overwork because of the great interest which they find in the additional materials. Enrichment may begin at an early age when it is possible to read several primers in the first grade; and in the later elementary grades and in high school, the enrichment programs have unlimited materials at hand. Since gifted children lead lives filled with a great variety of interests, enrichment is a practical avenue of approach to it.

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[1] P. Witty (ed.), *The Gifted Child*, D. C. Heath and Company, Boston, 1951, p. 262.

Acceleration, segregation, and enrichment may be practiced in various combinations as well as in isolation. There may be acceleration with segregation, acceleration with enrichment, and segregation with enrichment, or all three may be practiced together. There are unlimited possibilities for research in these many types of adjustment programs for gifted children.

Results of Cleveland's Major-Work Program

Recently Sumption[1] has made a thorough and illuminating study of the results of Cleveland's major-work classes. He compared a control group of sixty-five adults of equally high intelligence who had not had the major-work program with a group who had spent from one to three years in major-work, and a third group who had spent from four to twelve years in this program. In each of the three groups there were 34 women and 31 men. A questionnaire of 59 questions was returned by all of these adults, and approximately one-third of the 1120 major-work graduates who could be located cooperated by sending in the information.

Some very marked results in favor of the major-work program were reported when results by groups were summarized. The major-work program developed a greater sense of social responsibility and its members held more positions of leadership. They had received more scholarships, awards, and citations. They had had more opportunitity to develop their individual aptitudes and a wide range of self-expression. Critical thinking was developed in a larger measure, as well as a

[1] M. R. Sumption, *Three Hundred Gifted Children*, World Book Company, Yonkers-on-Hudson, N. Y., 1941, 235 pp.

more ambitious attitude with regard to their vocational careers. In leisure-time activities the major-work groups do more reading of nonfiction books, professional and technical magazines, and more of them go to college. In spite of greater emphasis upon many phases of enrichment in various fields, the major-work program did not sacrifice the acquisition of fundamental knowledges and skills. There were no important differences in health between the groups, and the major-work program did not harm the health nor impair the eyesight of pupils.

The Stanford Study of Gifted Children

The Stanford Study of gifted children was initiated in 1921 by Dr. Lewis M. Terman who has made a regular follow-up study of the same individuals from time to time over a period of twenty-five years. The reports of the early examinations and of the characteristics of 1500 children were described in Volumes I and III of *Genetic Studies of Genius* by the Stanford University Press.

The initial high level of intelligence quotients, ranging from 135 to 200, with an average of 152, was maintained in the majority of cases in adulthood, which proved that intellectually superior children become intellectually superior adults. Superiority in mental abilities was generally found but varied in amount depending upon the type of testing materials. Excellence was also shown in traits of originality and in behavior which is closely related to intelligence. It is a sad commentary upon educational procedures that while in elementary school gifted children on the average were kept at school tasks fully two or three full grades below the level of achievement that they had attained on standardized educational achievement tests.

Although these gifted children were not placed at the proper level of grading, they continued into higher education with almost 90 per cent entering college and almost 70 per cent graduating, which, in both instances, is about eight times more than the corresponding figure for the general population of their time. It was noted that some who did not attend college were prevented by ill health, but many others did not attend because of lack of good guidance and encouragement by their high schools.

The great majority of the entire group were found to be in the professions or in the higher business occupations, with only four per cent in the four lower occupational classes, as measured by the Minnesota Occupational Scale, in which more than half of the general population are to be found. They maintained their general superiority in marriage rate and in good marital adjustments and in all-round social adjustments as well. The incidence of delinquency was very low and mortality rate was only four-fifths of the normal expectation. The superiority of these gifted individuals was demonstrated in practically all of the many areas which were studied and reviewed.

The Conservation of Talent

Society is quite negligent in conserving the talents of gifted children. In many school systems where group mental and educational tests are administered to all pupils, little is done about the gifted who may be identified from the test results. In other systems, gifted children often spend their entire school life without being detected, nor is any particular interest taken in them. In addition to educational apathy, there is also the effect of the limited economic factor. Goetsch [1] found that more than 90 per cent of superior high-school graduates from well-to-do families were attending college as contrasted with less than 20 per cent from families with limited incomes.

An annual Science Talent Search was initiated in 1942 by Science Service and financed through the Westinghouse Educational Foundation of the Westinghouse Electric Corporation. In addition to the national movement, about one-half of the states have organized State Academies of Science so that high-school seniors have additional opportunities to obtain scholarships. From 15,000 entry blanks and examinations distributed to high-schools each year, about 3000 of them are completed, followed by further more difficult hurdles, until the final group is reduced to 300. The highest forty of this highly selected group attend the Science Talent Institute in Washington, D. C. and the remaining 260 receive honorable mention. Follow-up studies reported by Edgerton and others[1] are beginning to show very encouraging results. This movement is undoubtedly bringing more attention not only to science but to other school subjects as well, and is stimulating interest in society's most talented children.

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[1] H. B. Goetsch, *Parental Income and College Opportunities*, Teachers College Contributions to Education, No. 795, Columbia University Press, New York, 1940.

In the resourcefulness of the gifted, there is promise for the conservation of human life and of the natural resources of the earth. Society owes itself a duty to conserve all of its potential assets. Neglect of the gifted has made them the most severely handicapped of all of the types of exceptional children. The handicaps from which they suffer can be remedied and the rewards to themselves and to society will be amply repaid.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Describe the most talented child you have ever known.
2. Cite evidence for or against the idea that the gifted have uneven developments.
3. Report on Goddard's book, *The School Training of Gifted Children.*
4. Visit a class for the gifted and report your impressions.
5. Discuss reasons for or against segregation.

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Part IV

Neurological and Psychogenic Diseases

Chapter XIX

EPILEPSY

There has always been much confusion about mental diseases and mental conditions. In Part III the various mental deviations were mainly conditions rather than diseases. A mental condition such as feeble-mindedness is a lack of complete mental development but not necessarily accompanied by any organic disease or derangement. The term "disease" suggests some breakdown or disability affecting the structure of the nervous system itself. Within the field of mental diseases the problem is complicated further by the fact that some mental diseases apparently have no physiological bases but are purely of a mental or psychogenic nature. In Part IV several kinds of mental diseases will be presented including epilepsy, and encephalitis.

Epilepsy has long been a word which has carried much mystery and dread. Although the number of cases is small, the violent and unusual nature of the disease has attracted widespread attention. The confusion which occurs in a schoolroom when a seizure occurs among a group of children who have never witnessed one previously is one of the most trying ordeals that any teacher is called upon to handle. The author had his first experience with epilepsy when a young adult had a *grand mal* attack in the crowded parlors of a church social.

As with other diseases and defects, there are degrees of severity which merge imperceptibly from one group to the next. In epilepsy the most marked degree is the *grand mal* attack in which violent convulsions occur accompanied by extreme bodily and mental disturbance. The second type is the *petit mal* attack in which only momentary lapses of attention occur, but these may be very disturbing to the mental life of the individual. There is some controversy over the existence of milder types sometimes called the epileptic personality. This occurs in some individuals who show neither the *grand* nor *petit mal* types. Students of epilepsy claim that there is no type of personality distinctly characteristic of epileptics, although case material and reports about it are to be found in the literature.

As in the case of speech defectives, there is some question as to where epilepsy should be classified. It has numerous emotional and psychological characteristics. It is also classified among the miscellaneous types of mental illnesses in a listing by the American Psychiatric Association. There is evidence that it is related to chemical changes in the brain which would classify it among neurological disorders. Rather than spending time in idle speculation over where such cases should be classified it is more important to study them from various points of view and coordinate the findings so as to bring about maximum remedial programs and preventive measures.

Characteristics

There have been many investigations into the characteristics of epileptics, some by hospitals, some by state schools or homes, and some by public-school centers. They will be discussed from several points of view.

Personality. Certain personality characteristics of epileptics have been emphasized and possibly overrated as being unique to this type of the exceptional. At the very outset it should be stated that when epileptic children are not given special medication to relieve their condition, and when they continue to be misunderstood and socially ostracized, personality characteristics are likely to develop. They feel frustrated and resort to various types of antisocial behavior as outlets for their emotions. They labor under excessive mental strain to control and, if possible, to prevent the occurrence of the episodes which lead to their social isolation.

At this point it is timely to note that similar patterns of malbehavior and emotional disturbances are characteristic of other exceptional children when their defects are not corrected or when no special educational provisions are made for them. Speech defectives show such behavior, sight-saving candidates are potentially nervous and overstrained, the deaf respond by ingoing behavior. Every type of exceptional child has its patterns of unique response. Epileptics are no exception. They are capable of marked improvements and socially acceptable behavior when proper medical and educational treatment are provided. Some very remarkable adjustments have been made in the personality and emotional disturbances in many epileptic children after they have been enrolled in the special school for epileptics in Detroit. It is mostly a mistaken impression that epileptics show unique personality patterns at all times and under all conditions.

As a result of his observation of many epileptic children and from reports by their parents Bridge[1] writes:

> Parents frequently describe a change in the child's behavior at the time of the onset of seizures. He becomes irritable, nothing satisfies him, his span of attention is short, he sleeps restlessly, demands his own way, and if not given whatever he wants, pouts resentfully or goes into a temper tantrum. He seems to lose interest in things that he formerly enjoyed. From then on the situation grows steadily worse until he fights with his former playmates, needs constant supervision at play, and requires frequent disciplinary measures. School loses its attraction, and he spends his time annoying pupils and teachers. School work suffers. Such instances are common among epileptic children and are enough to try the patience of the best of families. In such a situation lie the elements of permanent personality disorders.

Harriman[2] compared results of the Kohs Ethical Discrimination Test between twenty-five normal nonepileptic individuals with a like number of advanced cases of *grand mal*. He found that the epileptics were deficient in ability to solve moral problems as well as in general weakness in response to the entire test. This general weakness was a reflection of limited mental ability or mental deterioration which is believed to occur in the more advanced and severe cases. Outbursts of temper, impulsiveness, and boasting with grandiose ideas are noted by several writers. It should be remembered that individuals without epilepsy sometimes show one or more of these same behavior manifestations, hence diagnosis should not be made from such behavior alone.

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[1] By permission from *Epilepsy and the Convulsive Disorders in Children*, by E. M. Bridge. Copyright, 1949. McGraw-Hill Book Company, Inc., New York, pp. 169–170.

[2] P. L. Harriman, "The Ethical Discrimination of the Epileptic," *Journal of Abnormal and Social Psychology*, 1936, **30**, pp. 411–418.

Intelligence. Various investigators such as Fetterman and Barnes,[1] Sullivan and Gahagan,[2] and others found median I.Q.'s ranging from 74 to 92, which indicates a range of ability by groups from low average down to high levels of feeblemindedness. At the White Special School in Detroit for the three-year period from 1937–1940 the I.Q.'s of the greatest number fell between 70 and 99.

Lennox [3] reaches practically the same conclusion in a study of 4958 epileptic patients admitted to the Craig Colony in New York State over a fifteen-year period. Lennox and Collins[4] administered a series of intelligence tests to ninety-three sets of twins and of this number thirty sets had a history of seizures. The average intelligence quotient for the nonepileptic twins was 108, and for the epileptic twins, it was 96.

Since epilepsy is evidently associated with some resultant effect to the brain it might be logical to assume that its victims would suffer from such disturbances and from limitations of mentality. A summary of various studies by Pintner, Eisenson, and Stanton [5] indicates that only a small minority of them have marked deterioration, with greater tendencies to a lowering of the I.Q. among the more severe cases of long duration.

The Number of Cases

Since there are varying degrees of severity in epilepsy, it is difficult to arrive at a definite number of individuals who are subject to it. A somewhat broader classification under the general title of convulsive disorders yields a much greater number of cases than the more restricted terms of epilepsy which include chiefly *grand mal* and *petit mal* attacks. Hysterical attacks, fainting spells, and the trauma from pains such as acute indigestion are sometimes mistaken to be epilepsy. Bridge [1] comments as follows:

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[1] J. Fetterman and M. R. Barnes, "Serial Study of the Intelligence of Patients with Epilepsy," *Archives of Neurology and Psychiatry*, 1934, **32**, pp. 797–801.

[2] E. B. Sullivan and L. Gahagan, "On Intelligence of Epileptic Children," *Genetic Psychology Monographs*, 1935, **17**, pp. 309–376.

[3] W. G. Lennox, "Mental Defect in Epilepsy and Influence of Heredity," *American Journal of Psychiatry*, **98**, 1942, pp. 733–739.

[4] W. G. Lennox, and A. L. Collins, "Intelligence of Normal and Epileptic Twins," *American Journal of Psychiatry*, **101**, 1945, pp. 764–769.

[5] R. Pintner, *et al.*, *The Psychology of the Physically Handicapped*, pp. 299–303.

> The general fact is clear that approximately four individuals per thousand are subject to epilepsy at some time during their lives. In addition, a great many others, usually in childhood, have one or more convulsions that never go on to the state of recurrent seizures that would be called epilepsy. Among the children attending the Out-patient Department of the Johns Hopkins Hospital there were three to five times as many children having convulsions that were not diagnosed epilepsy as having epilepsy itself. Furthermore, a diagnosis of some form of convulsive disorder was made on one child out of every 20 to 25 attending the entire pediatric clinic.

The report by Bridge was a little more conservative than the findings from the examinations of draftees for both World War I and World War II in which about 5 per 1000 were rejected for military service because of epilepsy. In World War II additional surveys from time to time steadily increased the number until it reached the 5 per 1000 noted above.[2] Various surveys show that epilepsy is about equally prevalent among males and females.

Garrison [3] makes the following observation:

> Epilepsy is by no means a rare ailment. Recent studies suggest that from one half to a quarter of a million people in the United States may be a victim of it. There are no exact figures as to the number of children who are subject to seizures. We do know, however, that in approximately 80 per cent of all cases the onset comes to persons who are less than twenty years of age. It is

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[1] By permission from *Epilepsy and the Convulsive Disorders in Children*, by E. M. Bridge. Copyright, 1949. McGraw-Hill Book Company, Inc., New York. P. 17.

[2] *Physical Examinations of Selective Service Registrants during Wartime*, War Department, Medical Statistics, Bulletin No. 3, Government Printing Office, Washington, D. C., 1944, p. 126.

[3] K. Garrison, *The Psychology of Exceptional Children* (rev. ed.). Copyright, 1950. The Ronald Press Company, New York, p. 460.

estimated that one tenth of these are in institutions, at an annual cost to the public of over $20,000,000. Many in the community are self-sufficient, while many others could be if there were an enlightened public understanding of their problems and needs.

Causes

Convulsive disorders which lead to epilepsy do not have a single cause, but rather a great variety of causative factors which frequently operate in combination within the individual. The five major headings of causes listed by Bridge[1] are heredity, brain injury, physiological disturbances, personality maladjustments, and environmental strains. Since some families are more prone to epilepsy than others, heredity undoubtedly plays some causative role. Brain injury produces disturbances in the metabolism of the body which affects the nerve cells so that the attendant nervous irritability results in convulsions.

Environmental strains from tensions within the home, from jealousy, favoritism, extreme criticism, and from outright rejection lead to personality maladjustments. This area of maladjustment which has often arisen from within the home gradually extends its effects to the neighborhood, to the school, and completely encompasses all of his environment. The social rejection which develops also spreads to his emotional life and eventually may result in physiological disturbances as well. Convulsive disorders often follow as a natural corollary and another epileptic individual is added to the community.

Diagnostic Procedures

The diagnostic procedures for convulsive disorders fall into two general classes: the informal, and the formal methods. The informal method may not make a bona fide final diagnosis but the evidence which it provides may lead to it. When the family, the teacher, or the man on the street witnesses some type of convulsive attack it may be believed that the individual is suffering from epilepsy. Final diagnosis from such symptoms cannot be made with certainty although repeated evidence of this kind is an aid to medical diagnosis. Some formal methods will now be presented.

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[1] E. M. Bridge, *op. cit.*, p. 519.

Electro-encephalography. As recently as 1929, Hans Berger, a German psychiatrist, reported that electrical activity of the human brain was measurable and from this beginning the science of electro-encephalography was born. As the electro-encephalogram machines have become perfected, the uses of this measurement technique have rapidly increased. Small metal electrodes are attached to various positions on the scalp from which it is possible to register the variations of the electrical activity of the brain on a kymograph. The preparation of the child or adult for this reading is very simple and causes no emotional disturbance or fright.

The waves of electrical variations disclose amplitude or width, which indicates the voltage, whereas the frequency or speed of wave occurrence ranges from fast to slow. In the records of normal individuals with no evidence of convulsive disorders, there is a gradual evolution in the nature of the brain waves from the newborn baby to the adult. This range begins with slow waves in an irregular baseline sway at the rate of about one or two per second to an average of about ten and one-half per second by the age of fourteen years. Various types of convulsive disorders show characteristic deviations from the nonconvulsive groups.

The electroencephalogram has recently been proved valuable in the selection of aviators. Thorner, Gibbs, and Gibbs [1] report that ten and a half waves per second is the most ideal for successful flying. Slight deviations from this point in either direction are related to decreased flying ability. About 10 per cent of control subjects show minor variations of an epileptoid type which may masquerade as carelessness or inexcusable error. These statements as to frequency and degree of epilepsy correspond to the distribution of such defects as vision or hearing in which there are large numbers with very minor deviations, a smaller number with rather marked deviations, and a very small per cent with extreme handicaps. Gibbs and Gibbs[1] have published a 221-page *Atlas of Electroencephalography* which gives many details with illustrative plates, showing normal conditions, and epileptic, brain tumors, brain injuries, and various other neurological and psychiatric disturbances. It is evident that the electroencephalogram has many possibilities in the investigation of mental and neurological disorders. The apparatus costs several hundred dollars, needs a soundproof room for best results, and a skilled technician to operate and interpret it. A vast amount of new research findings resulted from its use with the armed forces, which is now being applied to civilian use.

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[1] M. Thorner, F. A. Gibbs, and E. L. Gibbs, "Relation Between the Electroencephalogram and Flying Ability," *War Medicine*, Chicago, 1942, 2, pp. 255–262.

Pneumo-encephalography. The pneumo-encephalogram is a special type of X-ray technique which shows, not only the bones of the skull, but also the detailed condition of the brain as well. In this method some of the spinal fluid is removed by a lumbar puncture and air is substituted for it. These air pockets show as dark spots on the X ray and may indicate injuries or areas of brain deterioration. This method of diagnosis for brain injury is very successful but requires a hospital procedure involving about three days' time. Davis[2] reports on the case of an eleven-year-old girl whose encephalogram eventually followed from a severe automobile accident. A large area of damage had occurred which would never be healed, making it necessary to place her in a protective environment with as much medical treatment as possible. After some months in a state institution she has become more stabilized but must spend her days there, with greater profit to herself, however, since she could not meet the usual competitions of life at home and in the regular classroom. Without the encephalogram she would probably have become a much more aggravated case of *grand mal*, with all of its painful and undesirable features.

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[1] F. A. Gibbs and E. L. Gibbs, *Atlas of Electroencephalography*, F. A. Gibbs, Boston City Hospital, Boston, 1941, 221 pp.

[2] D. B. Davis, "The Epilepsies," *Journal of Exceptional Children*, 1939, **5**, pp. 166–175, 178.

Other diagnostic procedures. A third method of diagnosis is known as subdural puncture which is performed on babies and on young children who are found to have brain hemorrhage. It is a medical procedure of a technical nature the details of which do not concern the parent or teacher. The physician may also use some method of artificial induction of seizures. Bridge[1] reports that many methods have been tried, "but at the present time overventilation, metrazol injection, and overhydration continue to be useful."

Types of Convulsive Disorders

Grand Mal. This type of epilepsy is the most severe of all. There is a sudden loss of consciousness with falling, sometimes accompanied by physical injuries in so doing. Immediately following this phase, the muscles of the body stiffen out but usually for less than one minute, to be followed by spasms or violent jerking of the muscles. If the tongue is caught between the teeth, it is likely to be severely lacerated. This phase lasts from one to five minutes from which the patient may pass into a stupor lasting from a few minutes up to several hours. There is a slow recovery accompanied by headaches and feelings of general depression. These results may be due to the condition itself or to the realization of its significance.

About one-half of the *grand mal* cases have some mental warning which they describe as "weakness and fear," "dizziness" or by similar terms. Such warnings are known as *aura*, and often enable the patient to lie down before the period of unconsciousness. Many of them have intensified feelings of well-being and grandeur shortly before the attack. They make some very ambitious plans, with great exultation, which is sadly deflated after the seizure is over.

Petit Mal. *Petit mal* is a type of mild attack, as the term indicates. It may be of a temporary nature and pass unnoticed by the untrained observer. There are brief lapses of consciousness in which the patient ceases doing whatever was at hand, such as reading, eating, walking. Some of these activities, such as walking, may continue automatically. The lapses probably merge almost imperceptibly into the minor lapses and shifts of attention when any individual, busied with a large number of different tasks simultaneously, pauses in one to give attention to another. Some cases of *petit mal* may have many daily attacks, but with no marked interference with usual tasks; others become progressively worse and develop into *grand mal* with all of its more severe complications. There are some marked cases of *petit mal* which border very closely upon *grand mal*, without being diagnosed as such. People so affected are believed to be indifferent and stubborn, antisocial, mentally retarded, and to offer lapses of hearing and various other incorrect reasons for their general attitudes and behavior.

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[1] E. M. Bridge, *op. cit.*, p. 552.

Other types. In addition to the two main types there are many other kinds of convulsive disorders involving motor seizures which Penfield and Erickson[1] divide into four main categories: Jacksonian, masticatory, simple adversive, and tonic-postural seizures. The Jacksonian type may result from some kind of head and brain injury, severe enough to affect the brain in the vicinity of the motor area and which spreads slowly enough to adjacent areas to be recognized through visible motor movements. In the masticatory movement, seizures there are disturbances of chewing and swallowing; in the adverse seizures, the patient feels his eyes and head turning away from the side in which the lesion is located. Tonic-postural seizures involve the brain stem and subcortical attacks. In their *Atlas of Electroencephalography*, Gibbs and Gibbs note a special type of reading which they identify as psychomotor seizures, and in which children so afflicted show much irritability and allied symptoms.

Preventive Measures

There are two important areas of preventive measures: medication, and optimum environmental influences. Medication is an area outside of the immediate responsibility of teachers, although both teachers and parents should always be alerted and willing to observe the reactions so as to aid the physician in the course of his treatment. Bromides have been used for about one hundred years and are known to be effective in patients with major seizures but in *Petit Mal* attacks they may be actually harmful. Phenobarbital is a second type of medication which is easy to administer and is quite successful in controlling seizures over a long period of time if not completely curing them. Dilantin or phenytoin is a third type of medication which has been used rather widely in the past few years. It has seemed to bring more successful results with adults than with children, and in some instances it was successful on some adults when it had not been on these same individuals in their childhood. Ketogenic and dehydration diets are somewhat difficult to follow but are known to be effective when observed in exact detail.

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[1] W. Penfield, and T. C. Erickson, ***Epilepsy and Cerebral Localization***, Charles C. Thomas, Springfield, Ill., 1941, pp. 15–17.

Optimum environmental influences should always be afforded to all individuals with any type or degree of convulsive disorders. It is a recognized fact that some convulsive disorders have their origins solely in unfavorable home and community surroundings. In the cases of known hereditary epilepsy, the optimum conditions should also prevail. There should be a reasonable restriction of physical activity for reasons of safety with the avoidance of psychological frustrations from too much caution and inactivity. In many ways the standards of behavior and discipline should be much the same as for the nonepileptic child.

History of Epilepsy

Famous characters. As in other fields of the exceptional there have been famous characters who were epileptic. Alexander the Great, Caesar, and Napoleon were three world conquerors reputed to have been subject to epileptic seizures. It was known that Napoleon had some type of seizure in which he was carefully secluded by a small staff of trusty aides. They unfailingly reported that he was resting and could not be disturbed. It is interesting to relate the cycle of the epileptic to the military psychology of these conquerors. It has been noted that in the period immediately preceding the seizure there is a great feeling of well-being and of ideas of grandeur, which may have been the periods in which the overly ambitious plans of these war lords were laid. Since the history of the world has been greatly affected by these three military figures, it is evident that epilepsy has played an important role in the affairs of mankind. Charles Lamb was an epileptic, but it did not interfere with his career as a famous writer.

History of the treatment. The Greek physician Hippocrates devoted 4 per cent of his writings to epilepsy, and in 1684 Willis gave 10 per cent of his space to this subject. Throughout the centuries epileptics have been subject to all kinds of quackery and charlatanism in order to seek a cure. Various kinds of drugs and patent medicines have been used which generally develop a state of stupor so that the violent action of the brain cannot occur as it does in unrestricted seizures. These medicines are no permanent cure and produce other undesirable effects. It is only very recently that the nature of epilepsy is becoming known, and that newer types of medicine have shown evidences of real cure in a large percentage of cases. The use of the electroencephalogram in discovering disturbances in nerve activity is opening a new field for the study of epilepsy, its causes, and characteristics.

Educational provision. As noted earlier the educational plight of the epileptic has been the most severe of all types since they have usually been excluded from school. This neglect has been more severe than that often accorded to the totally blind or deaf child who may have been allowed to attend a school with normal children so as to get whatever he would from the program. Many epileptic children of average or superior mentality feel the emotional effects of such isolation very keenly. The Detroit School, established in 1935, was the first public school to meet this problem in an educational manner.

The Detroit School

Since the Detroit School for Epileptics, known as the White Special School, was the first and chief educational attempt, some mention will be made of its history and program. The Detroit Board of Education in 1933–1934 asked for a survey of epileptic children in order to discover the extent of the problem. The city Department of Health through its nurses and physicians was asked to prepare a list of known cases; these were supplemented by a list prepared by the author in his capacity as Director of the Psychological Clinic. His list included many who had been excluded from school. The Board of Education was not satisfied with a mere statement of numbers but requested the name and address of each pupil. From the various sources a list of approximately four hundred names was prepared. It was evident that there was a big problem of epilepsy.

A school was opened in January, 1935, with thirty-five boys as members, in the Schulze School. It was conducted as a hospital as well as a school with the children remaining at the building from Monday morning through Friday afternoon. At first it was feared that placing many epileptics together would increase their seizures through suggestion, but it was soon found that these cases had about only one-half as many seizures at school as they formerly had had at home. In the following year girls were admitted and used the hospital plan for the first semester while the boys were transported to and from the school daily, by bus. At the end of the school year in June, 1939, the hospital plan was abandoned and all children were transported daily. At first there were quite a few seizures on the buses, but these have gradually reduced in number. The period of hospitalization was very valuable because it was possible to give careful study and have full control of diet for the twenty-four hour periods. At present there is always a nurse on duty at the school.

In the past few years, there has been an annual enrollment of nearly 200 pupils with many from the upper elementary grades and some from high schools. A visitor would probably detect nothing unusual or different from any regular school since seizures are comparatively infrequent and are taken as a matter of course, with the child removed to the clinic until recovery. The average length of enrollment is one year, after which most of them are returned to the regular grades.

By June, 1951, a total of over 3000 children had been examined and with a total of approximately 1100 enrolled in the school since its opening in 1935. The clinic had been conducted by Dr. O. P. Kimball,[1] who has been in charge since its beginning. The popularity of the school and clinic became so great that epileptic adults also came for treatment. Eventually they were refused service since the program was limited to children of school age. Many children are referred to the clinic who have had various types of convulsions which did not prove to be epilepsy. Such problems as digestive disorders, or temper tantrums in order to gain their own way, are among those who are rejected. It is hoped that through widespread use of the electroencephalogram machines the differentiation of true epilepsy from various types of emotional disturbance will be more successful.

There appears to be a great amount of emotional stress and disorder in the background of many epileptic children. In the quiet regime of the epileptic school these tendencies diminish to a great extent, even if medical therapy is not practiced. It is believed that many nervous and unstable children without true epilepsy would profit greatly from the regime offered in this special school for epileptics. It is hoped that this school will serve in a modest way as a model for other school systems to follow in solving their educational problems of epileptic children.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Describe an epileptic case that you have known, with symptoms and general characteristics.
2. Consult Pintner, Eisenson, and Stanton, *Psychology of the Physically Handicapped*, for further references on characteristics of epileptics.
3. Consult historical sources for more accounts of famous people who have been epileptic.
4. List some of the former types of medical treatments, patent medicines, and the like, with their probable limitations.

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[1] O. P. Kimball, "A Social and Medical Study of Epilepsy," *Journal of Exceptional Children*, 1939, **6**, pp. 103–104.

5. Visit any hospital or the office of any physician who is primarily interested in epilepsy and have an explanation of cases.
6. Witness the operation of an electroencephalograph machine and study the interpretation of results.
7. List types of occupations suitable and unsuitable for epileptics and give reasons for your choices.

Chapter XX

PSYCHOTIC CONDITIONS

The classification of psychotic conditions and diseases is difficult because of many complicated symptoms. The problem centers around whether or not psychotic conditions should be considered as of neurological or of mental, psychogenic origin. Medical authorities in this field, known as psychiatrists, are puzzled about the origin or etiology of some mental diseases. For some, etiologies are known; for others, they are not. A large number are known to be of a neurological character, and a small minority of mental or psychogenic nature. For practical purposes they are all placed with the neurological diseases in the present classification.

Practical Definitions and Considerations

Because of recent popular interest in mental diseases, it is desirable to give some practical definitions and considerations. In the early days the general term of "insanity" was applied to all unusual mental diseases and conditions. This term has fallen into general disfavor and has been replaced by the more meaningful term of "mental illness." Mental illness is also designated by the term "psychosis," which is loosely defined as a mental derangement. For example, senile psychoses are the various types of mental illness or psychoses associated with old age. "Psychotic conditions" is a loose term to describe many types of mental illnesses or psychoses.

The term "prepsychotic," which occurs frequently in psychiatric literature, indicates a condition tending toward an eventual psychosis. The term "psychopathic" indicates a condition rather than an active mental illness or psychosis.

The psychopathic individual has some degree of emotional disturbance which may border on actual mental illness but may never develop further in that direction and hence become a relatively permanent mental state. In other cases the development progresses and eventually a psychosis results. The psychopathic individual stands in the same relative position to mental illness as the typical sight-saving pupil does to blindness. Their conditions may remain static while continuing to border on extreme deviations. The prepsychotic case may parallel a visual condition such as progressive myopia in which the individual often passes from defective vision to complete blindness. These comparisons are made only for the sake of a better understanding of the terms and with no implication of any relationship between visual handicaps and mental illness.

The Significance of Mental Diseases for Children

Mental diseases are primarily characteristic of adults rather than of children, and hence have only an indirect bearing upon the discussion of exceptional children. Adolescents are more often mentally afflicted than young children. There is always a great challenge to psychiatry and psychology in trying to relate adult psychoses to psychopathic and prepsychotic characteristics of these same individuals in childhood. One problem centers around the need for discovering whether adult psychoses develop in later years only in children who were entirely normal in childhood. Many authorities believe that psychoses arise mainly from conflicts and conditions in adulthood and hence are not childhood problems. There is some adverse opinion, fortified by descriptions of children having unusual characteristics in their tender years. In solving this problem a longitudinal study of individuals is needed, which may be traced back in reverse order so that mental problems may be followed to their beginnings, whether in childhood or adulthood. At best it may be stated that there are probably some predisposing conditions in children which help set the stage for adult psychoses. There are also some psychoses which appear in children and which will be described shortly.

Classification of Mental Diseases

In 1933 the American Psychiatric Association revised its list of mental diseases into a classification of twenty-four types, as follows:

- Psychoses with syphilitic meningo-encephalitis (general paresis)
- Psychoses with other forms of syphilis of the central nervous system
- Psychoses with epidemic encephalitis
- Psychoses with other infectious diseases
- Alcoholic psychoses
- Psychoses due to drugs or other exogenous poisons
- Traumatic psychoses
- Psychoses with cerebral arteriosclerosis
- Psychoses with other disturbances of circulation
- Psychoses with convulsive disorders (epilepsy)
- Senile psychoses
- Involutional psychoses
- Psychoses due to metabolic diseases
- Psychoses due to new growth
- Psychoses associated with organic changes of the nervous system
- Psychoneuroses
- Manic-depressive psychoses
- Dementia praecox (schizophrenia)
- Paranoia and paranoid conditions
- Psychoses with psychopathic personality
- Psychoses with mental deficiency
- Undiagnosed psychoses
- Without psychoses, including epilepsy, alcoholism, drug addiction, and mental deficiency
- Primary behavior disorders

An inspection of this impressive list shows that many of the the psychoses have a neurological background and, therefore, there is much logic and reason in classifying mental diseases under neurological conditions. There are a few of these psychoses which are probably of psychogenic origin.

The Number of Cases

Mental disease is one of the greatest scourges of modern civilization. It is a little ironical to realize that man has devised such a complex state of living that he is unable to adjust to it. An alarming percentage of the population is unable to meet its rigorous demands. It is a startling fact that one out of every twenty-two persons, or approximately 5 per cent of the population, either develop actual psychoses at some time in their life or are dangerously near doing so. Mental cases constitute a greater number of patients in hospitals than the combined total of all other illnesses. When there is added to this number of active cases the marginal ones, as well as the worry and confusion in the homes of psychotic cases who have not been removed to institutions, the ratio of the amount of disturbance to the population rises to an unknown but staggering total.

Since there are some children with psychoses, some with psychopathic personalities, others with prepsychotic conditions, and many young adults with various mental disturbances, it is imperative that teachers be much more familiar with psychotic conditions. Auxiliary adjustment agencies of the school and community should be closely coordinated to make a concerted attack on the problem.

Causes

It has already been indicated that neurological conditions are among the principal causes of psychoses. Some psychoses are known to be of psychogenic origin or to spring from conflicts in the social environment. Other individuals sometimes live in equally poor environments and do not develop psychoses. This fact would lead to the conclusion that the psychotic person must have some constitutional defect, plus the environmental condition, as the basis of his difficulty.

Hereditary trends are very important in some of the psychoses. Barrett [1] stated that 78 per cent of 150 unselected cases of schizophrenia had hereditary tainting factors. Pollock and Malzberg [2] made a rigorous investigation of the backgrounds of 330 patients with either manic-depressive or schizophrenic psychoses and concluded that the numbers were not sufficiently high to establish them as recessive Mendelian traits. However, there is a probability that a generalized familiar basis did exist. The term "tainting factors" in describing family backgrounds is too indefinite for establishing true psychotic conditions in parents. Various other investigators found tainted backgrounds in from 40 to 90 per cent of their cases.

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[1] A. M. Barrett, "Hereditary Relations in Schizophrenia," *American Journal of Psychiatry*, 1927, **7**, pp. 77–104.

[2] H. M. Pollock and B. Malzberg, "Hereditary and Environmental Factors in the Causation of Manic-Depressive Psychoses and Dementia Praecox," *American Journal of Psychiatry*, 1940, **96**, pp. 1227–1244.

Lampron[1] studied 75 matings in which one parent had been committed to a state hospital with various types of schizophrenia, involving a total of 186 children. One-half of the families had from 1 to 4 children either mentally or socially maladjusted, involving a total of 56 children who were afflicted in various ways. While only three had definite psychoses, there were many other types of maladjustment, including marked emotional instability, mental deficiency, neurotic traits, sexual delinquency, and allied disorders. It is evident that hereditary effects are frequent and involve a variety of conditions.

Psychoses in Childhood

Psychoses are characteristic chiefly of adults and adolescents. They occur much less frequently in children. While conditions which predispose children toward psychoses are quite prevalent, the great clamor upon the part of school administrators and teachers for psychiatrists to diagnose behavior cases as active psychoses falls far short of their expectations. Even if the expectation were fulfilled, diagnosis itself would be relatively futile unless medical and special educational provision were made for them. Special classes for psychotic children are comparatively rare, although some school systems have special classes or schools for behavior problems in which psychotic and prepsychotic children are probably enrolled.

In the list of twenty-four types of psychoses, cited earlier, there are a few which may be associated with children as well as with adults. Congenital syphilis, epidemic encephalitis, infectious diseases, traumatic (injury) psychoses, psychoses with epilepsy, psychopathic personality, mental deficiency, and primary behavior disorders, comprising about one-third of the total, might be childhood psychoses in some instances. Adolescents sometimes suffer from alcoholic psychoses and psychoses from other drugs, such as marihuana cigarettes, as well as from schizophrenia. Certain other psychoses such as general paresis, cerebral arteriosclerosis, involutional psychoses, and senile psychoses are mainly characteristic of adults and of old age.

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[1] E. M. Lampron, "Children of Schizophrenic Parents," *Mental Hygiene*, 1933, **17**, pp. 82–91.

Schizophrenia in Childhood

Schizophrenia is a comparatively rare disease in childhood but it merits some discussion.

Characteristics. Bradley [1] reports eight separate characteristics of schizophrenic and schizoid children which distinguish them from cases of other severe behavior disorders. They are seclusiveness, irritability when seclusiveness is interrupted, day-dreaming, bizarre behavior, diminution in number of personal interests, regressive nature of personal interests, sensitivity to comment or criticism, and physical inactivity. Many of these symptoms are foreign to the behavior of normal children who usually show interest in and curiosity about their immediate environment. Seclusiveness and withdrawing behavior are important symptoms, although they are too often viewed with satisfaction and relief by parents and teachers from the customary noise and activity of most children. Regressions to earlier types of behavior might be confused with a simple continuation of them beyond the usual age, but this phenomenon is also true of mentally retarded children. The regressions may become very extreme and similar to babyhood behavior.

Other characteristics come to light in sudden erratic behavior, awkward and clumsy movements, and an interest in vague and abstract ideas rather than in concrete situations and problems. Compulsions and marked religiosity sometimes occur, with some delusions and hallucinations.

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[1] C. Bradley, *Schizophrenia in Childhood*, The Macmillan Company, New York, 1941, p. 33.

There are some interesting characteristics noted from the performances on intelligence tests. Piotrowski [1] observed that both schizophrenics and mental defectives did relatively better in speed than in accuracy as compared with normal children. Schizophrenics achieve more success on the verbal portions of the tests which is opposite to the performance of mental defectives. They also showed less variability on verbal than on performance material. On form boards they tend to improve their scores on retesting which is not characteristic of the mentally defective. In contrast to defectives, they do not respond to urging and praise.

In another article by the same author [2] it is reported that upon testing schizophrenics with the Rorschach test, he noted a perseverance of ideas closely connected with the patients' personal experiences, uneven performance with many vague and absurd responses, poor original responses, and absence of inductive reasoning.

Number of cases. Childhood schizophrenics are comparatively rare as compared with many other types of exceptional children. Lurie, Tietz, and Hertzman [3] found only thirteen cases out of a thousand consecutive cases in the Child Guidance Home in Cincinnati. Kanner [4] reports twenty-one children under thirteen years of age in the Children's Psychiatric Service of Johns Hopkins Hospital since 1930 who could be diagnosed with certainty as schizophrenic. The consulting psychiatrist in the Psychological Clinic of the Detroit Public Schools recommends annually a small number of children for release from school and placement in mental hospitals for further observation and study. Childhood schizophrenia is about three times more common in boys than in girls. Michigan is now planning for more hospitals and treatment facilities for such children.

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[1] Z. A. Piotrowski, "The Test Behavior of Schizophrenic Children," *Proceedings of the American Association for Mental Deficiency*, 1933, **38**, pp. 332–347.

[2] Z. A. Piotrowski, "A Comparison of Congenitally Defective Children with Schizophrenic Children in Regard to Personality Structure and Intelligence Type," *Proceedings of the American Association for Mental Deficiency*, 1937, **61**, pp. 78–90.

[3] L. A. Lurie, E. B. Tietz, and J. Hertzman, "Functional Psychoses in Children," *American Journal of Psychiatry*, 1936, **92**, pp. 1169–1184.

[4] L. Kanner, *Child Psychiatry* (second ed.), Charles C. Thomas, Publisher, Springfield, Illinois, 1950, p. 722.

Types. In the adolescent and adult forms of schizophrenia four types are recognized: simple, hebephrenic, catatonic, and paranoid. Among children this type of classification does not apply too accurately, but if used, the catatonic forms are most frequent, with hebephrenic next in order, and with practically none as paranoid or simple. The childhood types are more conveniently divided into two, in terms of rate of development. One of these is the sudden onset or "acute" type, characterized by violent motor symptoms followed by subsequent remissions. The second type has a slow, insidious onset with gradual development of many characteristics noted in the preceding section.

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Since the catatonic type is the most frequent among children its symptoms are of immediate and practical interest. There is prolonged and uneven dilation of the pupils of the eyes, and increase of perspiration and saliva, and evidence of cyanosis, or a blue appearance of the skin, caused by a lack of renewed oxygen in the blood to maintain its typical red appearance. The chief manifestations are alternating periods of catatonic stupor and excitement. The catatonic stupor is divided into two subtypes with one state of great muscular tension and the other of complete flexibility, accompanied by simple mimicry of the motions and speech of others. In the period of excitement there is hyperactivity, shouting, tossing of arms, and constant repetition of senseless phrases or meaningless sounds. There is frequently need for restraint in order to avoid injury to self or to other persons.

Among the childhood types, hebephrenic schizophrenia is second in order of frequency. In the early stages it is frequently mistaken for melancholia, with considerable confusion and depression. The onset is usually sudden with delusions and hallucinations which are more or less detached from actual life and mental interests. Emotional deterioration becomes pronounced. Intellectual deterioration also gradually follows, particularly in the case of adults. There is great incoherence in speech and a jumble of words known as word salad.

Simple schizophrenia is more common in adults than in children, with a tendency to become gradually apathetic, negligent, indolent, and untidy. It is frequently mistaken for laziness or lack of ambition. Many of the adults do not become so badly affected that they reach mental hospitals, but more frequently join the ranks of hoboes, beggars, and ne'er-do-wells.

Paranoid schizophrenia is a disease of adulthood, since its complicating circumstances are characteristic of adult interests rather than those of children. There are delusions of grandeur which begin with minor ideas having some plausibility which gradually change into more absurd ones that are believed by the family to be due to long practice of exaggeration. The onset may be rather sudden with depression, insomnia, loss of appetite, and negativism. Delusions of voices telling them to take revenge for fancied wrongs may become dangerous to the victims of their overwrought imaginations.

There are also mixed types of schizophrenia in which the division into four distinct types becomes impossible; some authorities note that many cases fall into this classification.

Treatment. For many years it was generally believed that adult schizophrenia had no specific cure except rest and protection from injury, the disease being allowed to run its course. In some cases recovery was expected, in others it was not. In the past few years it has been discovered that various forms of "shock" therapy gave promise of success if the cases were taken rather early in the process. Chronic long-time cases show much less favorable results.

Various drugs, including insulin, have been administered in sufficient doses to produce a mental shock; after recovery from this temporary experience the patient became more nearly normal than before. More recently metrazol and other drugs have been substituted with less violent effects than insulin but with equal success. Bradley noted that some of these drugs have been used successfully on children. There will probably be further advances and improvements in such shock treatments which are hopeful signs for the unfortunate plight of schizophrenics both among adults and children.

Educational Provisions

Children in active psychotic conditions or in the advanced stages of prepsychotic conditions need a specialized school program removed from the usual competition with normal children. In the regular classroom their conditions are hastened and aggravated by punishment and disapproval for malbehavior. They need programs such as are provided in the Child Guidance Home in Cincinnati or the Emma Pendleton Bradley Home at East Providence, Rhode Island, or similar to the Franklin School for Encephalitics in Philadelphia which will be described in the following chapter. Obviously, there is need for very close cooperation between medical treatment and education.

For children with behavior disorders bordering on psychotic conditions as well as for adults who are predisposed to psychoses, there is need for a program of mental hygiene. For children the principles of child guidance should be practiced on a much wider and more effective scale than is now current. If the actual conflicts may be solved, if others may be anticipated and prevented, and a resistance built up against them, the vast army of unfortunate psychotics may eventually be reduced.

Whenever children with psychoses or dispositions toward psychoses do not have understanding treatment, their problems are aggravated. Too often parents and teachers assume that such children are in good physical and mental health and that behavior deviations arise from deliberately planned antisocial behavior. Under such circumstances punishment intensifies rather than lessens the unacceptable behavior.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Discuss any type of psychotic individual with whom you have been acquainted and describe his history.
2. Make a detailed report on several of the types of psychoses from the list of twenty-four shown in the text.

3. Visit a mental hospital and have a demonstration of the various types of cases.
4. Have a demonstration and explanation of the various kinds of shock therapy with results.
5. Report more fully upon childhood schizophrenic as described in Bradley's *Schizophrenia in Childhood.*

Chapter XXI

MISCELLANEOUS NEUROLOGICAL CONDITIONS

There are many other neurological conditions, including encephalitis, or sleeping sickness, enuresis, syphilis, and certain motor disturbances which often have a neurological basis. Since all of these conditions result in school maladjustment it is highly desirable that they should be given some consideration along with other types of exceptional children.

Encephalitis

Encephalitis, or encephalitis lethargica, is more commonly known as sleeping sickness. The word is derived from the Greek term *encephalon* meaning the brain, and the entire word indicates an inflammation of the brain. It is proper, therefore, to classify encephalitis under neurological conditions. Encephalitis also has many psychological and emotional characteristics which make its victims unusually difficult to train and adjust at home and in school.

From the standpoint of education it is the postencephalitic child rather than the active case which merits study since in the acute stages children are confined to their homes or to hospitals. There is a period of coma or lethargy, varying in length and severity, which has given it the popular title of sleeping sickness.

Encephalitis is an acute infection which breaks out in epidemics, but also occurs mysteriously in isolated cases. During World War I it began to make its appearance in Europe and soon spread to America, probably brought by expeditionary forces returning from abroad.

Characteristics. It has been estimated that approximately one-fourth of the patients do not survive, that approximately

1/4 don't survive

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survive
+ complete

one-fourth make a complete recovery, while about one-half survive but retain some difficult personality and emotional characteristics. It is this latter group with residual difficulties which are of most concern from an educational point of view. However, the symptoms of the onset of the disease are also important.

The onset of the disease may be sudden or it may take the form of a general drowsiness which, unfortunately, may not excite particular alarm. The disease is sometimes associated with influenza or may be attended with headache, nausea, and vomiting. These symptoms also occur in other diseases. Some of the more unique symptoms are double or blurred vision, inequality of the pupils of the eye, facial paralysis, and rigidity of the neck muscles accompanied by lethargy or coma. The disease tends to run its course in from two to twelve weeks. Frequently it is at a later time that the emotional and psychological characteristics come to light so that the true nature of the disease is tardily recognized. Kasinin and Petersen[1] have discovered that psychosis is an early sign of encephalitis.

Postencephalitic behavior. It is at this stage that great differences occur from the preencephalitic state. Listlessness, emotional instability, spells of crying, restlessness, and defiant attitudes are among the symptoms and changes which occur according to Jenkins and Ackerson.[2] Bond and Appel[3] note that children who were orderly and the cheerful before disease, became disorderly, disobedient, and irritable. They lie, cheat, steal, and sometimes commit gross sexual offenses. In a study of 144 cases Gibbs[4] discovered that some of these emotional outbursts occurred when the patients were not allowed to have their own way, but they also happened frequently out of a

[1] J. Kasinin and J. N. Petersen, "Psychosis as an Early Sign of Epidemic Encephalitis," *Journal of Nervous and Mental Diseases*, 1926, **64**, pp. 352–358.

[2] R. L. Jenkins and L. Ackerson, "The Behavior of Encephalitic Children," *American Journal of Orthopsychiatry*, 1934, **4**, pp. 499–503.

[3] E. D. Bond and K. Appel, *The Treatment of Behavior Problems Following Encephalitis*, The Commonwealth Fund, New York, 1931, 163 pp.

[4] C. E. Gibbs, "Behavior Disorders in Chronic Epidemic Encephalitis. Clinical Course in Relation to Signs of Persisting Organic Pathology," *American Journal of Psychiatry*, 1930, **9**, pp. 619–636.

clear sky. Unless the disease itself was known to have existed, it might go undiscovered with the belief that the child had naturally gone from bad to worse because of home conflicts, bad companions, or similar circumstances. It is obvious that such behavior creates a serious problem for the school and would be aggravated further by measures of punishment and discipline. This entire problem is much more severe both for the school and for the child than might be implied from the brief description which has just been cited.

Intellectual characteristics. Several studies of the intelligence of postencephalitic children have been summarized by Pintner, Eisenson, and Stanton, showing mean I.Q.'s from 75 to 91. There is a marked tendency for intelligence to deteriorate in many cases, as shown in various investigations, with a minority of cases sinking to a state of idiocy from their earlier normal intelligence. Brown, Jenkins, and Cisler [1] found a decrease in the average intelligence quotient from one examination to the other of 1.4 points per year, in a group of 108 encephalitic patients, ranging from infants to young adults. The deterioration is probably related to the severity of the disease and to the amount of destruction of the brain and nervous system. From personal contact upon the part of the author a few distressing cases of mental deterioration have been noted. There is often a feeling of utter discouragement and futility of any mental effort upon the part of these extreme cases.

The number of cases. The number of cases has been difficult to determine because the disease has often been overlooked or mistaken for other illnesses such as influenza. St. Louis, Missouri, seems to have been a center of the disease in America with heavy outbreaks in 1919, 1924, 1932, and 1933, and a continuous annual epidemic. By 1933, 741 cases had been reported in that city with 140 deaths or about one-fifth of the total number. California had a total of 949 cases in the decade from 1923 to 1932 inclusive, with 623 deaths or about two-thirds of the total, which is a much higher rate of mortality than reported in most other studies. These surveys are recorded by Scheidemann from data by Fox.

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[1] A. W. Brown, R. L. Jenkins, and L. E. Cisler, "Influence of Lethargic Encephalitis on Intelligence of Children as Determined by Objective Tests," *American Journal of Diseases of Children*, 1940, **59**, pp. 238–254.

The disease attacks all ages from small babies to old people. In England the number of males and females was approximately equal. In the experimental school of Bond and Appel at Philadelphia the boys outnumbered the girls about five to one. On account of the high mortality and the disastrous aftereffects upon those who survive it is very fortunate that the numbers are comparatively small.

Causes. As stated earlier, encephalitis results from an acute infection in localities where many are affected. It also occurs in isolated cases far from other known victims and is defined as sporadic forms. It is believed that the virus causing the disease is present in the secretions of the patient's nose and mouth. Webster [1] lists nine types of virus which produce some form of encephalitis, as follows: rabies, poliomyelitis, St. Louis encephalitis, Japanese B encephalitis, louping ill, X disease, equine encephalomyelitis, lymphocytic choriomeningitis, and "B" virus. Several of these are transmitted to man from animals, including rabies mainly from dogs; several are from insects including the Japanese B, and equine encephalomyelitis which is transmitted by horses. "B" virus is probably native to monkeys, lymphocytic choriomeningitis is transmitted to man from mice, louping ill affects sheep in Scotland, probably coming from insects. The St. Louis encephalitis is the type common in man appearing in the Midwest area during the summer. Its mode of transmission is unknown.

In the 1941 Yearbook of Neurology, Psychiatry, and Endocrinology [2] reports are listed concerning encephalitis resulting from whooping cough in Argentina, with fifteen cases among six hundred patients, chiefly confined to young children from three months to six years of age, and resulting in 80 per cent fatalities. In California one in one thousand who had had measles were also afflicted with encephalitis. Medical research has been very active in attempting to develop serums which would counteract encephalitis, and some hopeful progress has been made according to reports from the Mayo Clinic in 1941.

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[1] L. T. Webster, "Classification of Primary Encephalitides of Man According to Virus Etiology," *Journal of the American Medical Association*, 1941, **116**, pp. 2840–2841.

[2] H. H. Reese, N. D. Lewis, and E. L. Sevringhaus, *The 1941 Yearbook of Neurology, Psychiatry, and Endocrinology*, Year Book Publishers, Inc., Chicago, 1942, pp. 160–162.

The causes cited above are chiefly etiological. The area or topographical causes are mainly in the central nervous system. The cerebrum shows some widely distributed effects, but the main destruction occurs in the basal portions of the brain which are intimately associated with motor activity. The inactivity of muscles and general rigidity of expression are related to such motor disturbances. Hemorrhages of these brain areas are characteristic of the disease. As in the case of other diseases the diagnosis and treatment are medical problems, but there is also need for a wide interest upon the part of the public and particularly by teachers as to the nature and severity of the disease.

Encephalitis in some of its forms has been known in Oriental nations for several centuries, but its spread to Europe and America seems to have followed the military migrations of World War I of 1914–1918.

Educational treatment. Some extreme psychological and emotional characteristics of postencephalitic cases have already been cited which give a realistic picture of the problems shown by these children. They are very difficult to train and control both at home and at school. Minor incidents which do not disturb normal children or did not disturb these same children in their preencephalitic state now become extreme issues with excessive emotional upsets and general turmoil. Since the stamina of their general neurological constitution is much lower than before, they naturally respond in these ways. This phenomenon is an extension of the principle of individual differences as applied to neurological disturbances. Incidentally, when it is projected to the opposite end of the scale it discloses a few children of unusually high stamina who can take calmly any kind of confusion that would upset the child of average neurological stamina.

These unfortunate children need a very quiet and noncompetitive environment for many months or even for years until all the neurological recovery of which they are capable has been achieved. Too often the very opposite happens to them. They are chastised and disciplined at home and at school for unsocial and disturbing behavior. This treatment aggravates their condition and eventually creates emotional problems which persist long after the neurological effects have disappeared. Some of them are excluded from school as unteachable although their intellectual abilities may be average. Only a few parents can afford the private schools which have sufficient staffs and accept such cases. Many children are driven to such extreme acts of violence that they are committed to various types of correctional schools or penal institutions without the real cause of their antisocial behavior being discovered.

The chief center in which a carefully planned educational program for postencephalitics has been undertaken is the Franklin special school in connection with the hospital at the University of Pennsylvania at Philadelphia. Reports of this experiment have been made by Bond and Appel[1] in *The Treatment of Behavior Disorders Following Encephalitis* and in various articles. In their initial experiment sixty-two children twelve years of age or younger were selected for study. Fourteen of this number had many of the same behaviors and symptoms but had never had encephalitis. They served as a "control" group during the first study of the main encephalitic group. The entire program of twenty-four hours was given to a careful study of the medical, social, psychological, and educational factors. A quiet regime was always the rule and in the absence of undue strain and excitement these children made very satisfactory progress. Some of them had been at home for various lengths of time after the encephalitic period and before admission to the school. Their behavior had become progressively worse in most instances, but it improved under the more ideal conditions of the Franklin School.

Of twenty cases eventually discharged to their homes, nine made a good adjustment, five were doubtful, and six were poor. In a report by Appel[1] some years later, in 1935, he noted that about one-third of the children are able to return home and live satisfactorily. In the program of the school the emphasis was gradually changed from that of a hospital regime to play techniques, to child analysis, and to relationship therapy. He also concludes that there are many psychological factors to be taken into account as well as organic pathological factors in the program of rehabilitation.

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[1] E. D. Bond and K. E. Appel, *The Treatment of Behavior Disorders Following Encephalitis*, The Commonwealth Fund, New York, 1931, 163 pp.

This type of special school is needed in many of the larger centers of population. Merely allowing the children to remain at home or placing them in foster homes does not solve the problem.

The outlook. Among the unfavorable factors has been the gradual spread of encephalitis to all parts of the country, and with more sources of infection continually being discovered. The large-scale migration of military forces to all parts of the world in World War II may also bring its new stream of cases along with other new types of disease. On the favorable side there is steady improvement in medical science on how to combat and prevent disease, and such experiments as the Franklin School show possibilities of rehabilitation.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Describe a case of postencephalitis which you may have known, in the light of this discussion.
2. Report in more detail upon the neurological complications of encephalitis.
3. Make a more detailed report upon the Franklin School as to program and case studies.

Enuretic Children

Among the various types of neurological cases are enuretic children, commonly known as bed-wetters. The average, uninformed person is inclined to dismiss this problem as being characteristic only of young children and soon outgrown. It is true that there are children who show this tendency without any neurological complications, but unfortunately enuretic children are to be found of all ages, and the condition exists also among adults. Some cases show these symptoms only at night, some only by day, others are continuous, occurring both night and day.

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[1] K. E. Appel, "Encephalitis in Children," *Journal of Pediatrics*, 1935, 7, p. 478 ff.

Psychological characteristics. Regardless of the cause, there are strong emotional factors accompanying enuresis. It is considered a disgraceful habit, and obviously causes much trouble and inconvenience to the children themselves as well as to those who care for them. In the main it is known that punitive measures are generally ineffective and tend to create greater emotional stress and strain. There are many cases in which the cause is primarily psychological, others caused by jealousies between children, by parental discord, and similar factors. Various investigators have noted that enuresis occurs more frequently on nights following unusual excitement, too vigorous play, or similar situations. Partridge [1] found that enuresis was more common among the feeble-minded of Vineland Training School on a certain night of the week on which the weekly entertainment was staged during the evening. There is no particular relationship between enuresis and intelligence, except that mentally superior children are more often able to analyze the reasons for it and be able to control its emotional factors. This ability is less marked in slow and mentally backward children. Schroeder [2] found an average I.Q. of about 87 in forty-four boys between the ages of ten and seventeen who had enuresis, but with a range up to above an I.Q. of 110.

Number of cases. Comparatively little is known about the number of enuretic cases but they are a common occurrence among children studied in child-guidance clinics. Dunham [3] reported 7 per cent of eight hundred nervous children between the ages of seven and seventeen with enuresis. No estimates have been made for the general population, but it might easily amount to 1 per cent or possibly higher if the facts were all known.

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[1] M. N. Partridge, "A Study of Noctural Enuresis in Boys," *Journal of Delinquency*, 1937, **11**, pp. 296–308.

[2] P. L. Schroeder, "Enuresis in Adolescent Boys," *Archives of Neurology and Psychiatry*, 1927, **18**, p. 1953.

[3] F. L. Dunham, "Suggestion as a Therapeutic Measure in Nocturnal Enuresis," *American Journal of Diseases of Children*, 1916, **12**, p. 618.

Causes. Among the more patent causes of enuresis are certain physical conditions in the bladder, in the urinary tract, and in the sex organs. It is an obvious corollary that all possible medical and surgical treatment should be afforded in such cases. Neuromuscular fatigue is probably a strong underlying cause of enuresis, according to Grover.[1] He notes that long days of excessive play, overwork in school, hurried eating with undesirable foods, and eating between meals help to bring on enuresis. In the medical field many authorities believe it is a neurological disorder, or evidence of a neurotic constitution. Without doubt when more universal use of the electroencephalogram is made, many irregularities of the brain activity will be discovered in the case of enuretics along lines similar to those in epilepsy. In cases of spina bifida there is loss of control of the urinary mechanisms and such children are seldom able to attend school.

Remedies and preventions. In the treatment of enuresis there has been considerable research on psychological and on medical therapy often in combination. Crandall [2] reports that in a period of three years twelve of fifteen cases in a military school were cured through the regulation of fluid intake, food intake, bladder training, and allied measures. After reputed failure in all other forms of therapy Kugelmass [3] noted that fifty-nine of seventy-five children were cured by the oral administration of methyl testosterone or intermuscular injection of testosterone proprionate for a period of three to ten weeks, with ten children being improved and six failing to respond to any type of therapy. Since a great number of enuretic adults was discovered in the selective service there was much research on it at the adult level.

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[1] J. I. Grover, "The Etiology and Treatment of Enuresis," *Journal of the American Medical Association*, 1918, **71**, p. 626.

[2] W. L. Crandall, "A Method of Treatment for Nocturnal Enuresis," *Journal of Clinical Psychology*, 1946, **2**, pp. 175–178.

[3] I. N. Kugelmass, "Androgenic Arrest of Familial Enuresis; a Study of 75 Children," *New York State Journal of Medicine*, 1947, **47**, pp. 1369–1370.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Make a more complete report on enuresis as outlined by Scheidemann, Vol. II.
2. Consult other references cited in the text for more detailed information.
3. Discuss any serious case which you may have encountered.
4. Prepare a report on enuresis as disclosed in the Armed Forces of World War II.

Congenital Syphilis in Children

Syphilis has been one of the most dreaded diseases throughout the centuries. It is a bacteria disease most frequently associated in the popular mind with illegitimate sexual relations, with houses of prostitution, and affliction of the sex organs. As a matter of fact its effects spread throughout the body and affect all of its members, including the nervous system. In the present discussion emphasis will be directed mainly at the neurological aspects of the problem.

Psychological characteristics. Since the nervous system is affected it is obvious that many types of nervous behavior may be expected, such as habit spasms, fits of temper, irritability, and general emotional instability. It should not be assumed that all children who show these symptoms are victims of congenital syphilis since the same characteristics are found in other types of neurological cases including encephalitis and epilepsy. Some writers have shown that a considerable percentage of mental-deficiency cases are afflicted although congenital syphilis is also found at all ranges of the mental scale. An unknown number of children in various types of special classes especially in sight-saving classes, have congenital syphilis.

Number of cases. Dr. Thomas Parran, Surgeon General of the United States Health Service, reported that 518,000 new cases of syphilis came to light in 1935 including people of all ages. In a population of 130,000,000 this number is 1 in every 250, or 0.4 per cent. This army of over one-half million (which by the way does not qualify very satisfactorily for the military army) does not constitute the entire number since it represents the new cases of one year. When this number may have added to it an equal number of other new cases, year after year, there is undeniably a very large horde of syphilitics. Scheidemann [1] states that on the basis of her data, approximately 10 per cent of the adult male population have syphilis. Parran and Usilton [2] made a study of rural Negroes in a southern state and found as high as 24 per cent above one year of age with positive reactions on the Wassermann test.

Statistics on the number of children with congenital syphilis are very meager except that they probably represent a much greater number than was formerly believed. Royster [3] reported on Wassermann examinations of one thousand children in a mid-southern town; about 15 per cent of the Negroes and 7 per cent of the whites showed positive reactions. It is interesting to report that all but one of the 125 cases with positive reactions were referred to him for other reasons, chiefly problems of feeding, tonsils and adenoids, defective vision, general examination, and miscellaneous ailments.

Symptoms and methods of diagnosis. There are a few physical symptoms that are usually associated with congenital syphilis in children. One of the most common is *Hutchinsonian teeth* in which the two upper central incisors among the permanent teeth are small, malformed, and discolored with a single crescentic notch in the cutting edge which gives a notched appearance. The other teeth are widely spaced, stunted, or otherwise deformed, with the upper teeth more susceptible to deformities than the lower. The most common characteristic is an affliction of the eyes known as interstitial keratitis which was discussed in the chapter on the blind. It begins in one eye between the ages of five and fifteen years and soon affects the other. Some deafness is caused by it, sores or lesions occur in the skin, and the bones are affected with destruction of parts of the nose which results in a sinking of the bridge and an appearance known as saddle nose.

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[1] N. V. Scheidemann, *The Psychology of Exceptional Children, Vol. II*, p. 408.

[2] T. Parran and L. J. Usilton, "The Extent of the Problem of Syphilis and Gonorrhea in the United States," *American Journal of Syphilis*, 1930, 14, pp. 145–155.

[3] L. T. Royster, "A Statistical Study on the Incidence of Congenital Syphilis," *American Journal of Syphilis*, 1921, 5, pp. 131–134.

Involvements and impairments of the central nervous system are one of the common characteristics with the eighth cranial nerve most frequently affected. Quite often these neurological deteriorations do not take a serious form until children are a few years old and it is not often discovered until there has been extensive and irreparable damage to the nerve tissues. There are some epileptiform seizures which are mistaken for true epilepsy. Juvenile paresis sometimes develops, resulting in deterioration of intelligence, loss of memory, and other attendant psychological disabilities. The Wassermann test is the most reliable and acceptable means of diagnosis with practically 100 per cent efficiency. It is now evident that syphilis has much wider ramifications than merely the social implications of illegitimate sexual relations.

Causes. Syphilis is a bacteria disease which may be either congenital or acquired. In the congenital form the method of transmission is not an affection of the germ plasm itself but is due rather to the presence of the bacteria in the mother's body during pregnancy. Some authorities contend that such transmission is not a true congenital condition, but practically when it exists before birth it may be considered congenital in a broad sense of the term. These unfortunate children cannot in any sense be blamed or held responsible for their condition.

Remedies and preventions. Syphilis is a disease which may be conquered. Since 1920 England reduced the number of its new cases by one-half, and it is practically unknown in the Scandinavian countries. It is susceptible to medical treatment, and if an expectant mother who is infected is treated before the end of the fourth month of pregnancy, the child will be free from it. Many states have recently passed laws requiring blood tests before marriage licenses are issued, a practice which is already beginning to have effects in the number of new cases. In times of war there is likely to be an increase in syphilis and other venereal diseases from the houses of prostitution near army camps. The efforts of various groups such as the United Service Organizations to provide wholesome recreational activities is a hopeful antidote. The Federal Government gives moral support and aid to such enterprises which it believes should be supported and maintained by private, rather than by governmental authority.

Educational provisions. In the latent stages of congenital syphilis there is practically no danger of infection, so that children may be located in whatever type of class, regular or special, that is suited to their other abilities. Many of the unstable probably find their way into classes primarily for behavior maladjusted children, others may be placed in classes with vision defects, and others with those of lowered vitality.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Describe any case of congenital syphilis which you may have known.
2. Describe the Wassermann test procedure and its interpretation.
3. Outline a program by which the community may assist in reducing the ravages of syphilis.

Nervous-Motor Disorders

From the discussion of the various nervous diseases and disorders it is evident that when the structure of the nervous system is affected, important results occur in various portions of the body. The disturbances to the nervous system may result in actual destruction of nerve tissue, a weakened condition, or irritation. There are also psychological and emotional situations in which there is no actual physiological change but the emotional effects cause the nervous system to respond violently. It is, as yet, an unsolved problem whether some motor responses are caused by physical or psychological reactions in the nervous system, or whether they may be a combination of both. There is urgent need for further research to determine the exact nature of such disturbances. A few of these conditions will now be mentioned.

Tics. A tic is a muscle spasm of short duration which may appear in any part of the body. The person may pucker the muscles of his forehead, a tremor may develop at one corner of his mouth, or it may appear in other portions of the body.

In more severe cases of tics, there is probably a close relationship between mental and emotional causes, coupled with physiological outcomes. Several reports in the literature of tics discuss complex interrelationships among many causes with long-time therapy producing beneficial results in a substantial majority of cases.

Chorea. When such movements, as noted above, become more widespread and persist for long periods the condition is known as chorea. The child becomes so uneasy and restless that it is very difficult for him to do satisfactory work in school. Children of this type are often likely to be misunderstood. They seem uninterested in school and are driven to disturb the discipline of the classroom. Corrective measures along these lines are usually not effective and tend to aggravate rather than cure the condition. Periods of rest such as are offered in open-window rooms, better sleep, and proper nutrition are usually recommended, with successful results. Merely calling attention to the condition and urging the child to concentrate tends to make the condition worse. A milder form of this condition is known as *chorea minor*. Whether the chorea is caused by some external irritation, by some irritation of the nerves, or by other causes is not entirely clear, but proper rest and quiet under medical direction are usually successful cures.

In an earlier chapter on Speech Correction the importance of muscular and motor disorders was discussed, with particular reference to stuttering. Certain types of mutism also occur which may be associated with motor disorders instead of with deafness. Spastic paralysis is also associated with motor disturbances and was discussed in the chapter on Orthopedic Defects. It also is associated with cerebral birth injuries. Athetosis consists of a series of involuntary muscular contractions superimposed upon fairly good voluntary coordination. They often take a twisting, wormlike motion, either very rapid or slow, with the rapid types being mistaken for chorea. Frequently the muscles of the tongue and throat are affected with extreme disturbances of speech. Scheidemann [1] discusses this condition in considerable detail.

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[1] N. V. Scheidemann, *The Psychology of Exceptional Children, Vol. II*, pp. 84–96.

Ataxia is another type of motor disorder in which there is lack of coordination. A simple test of motor ataxia is to have the patient close his eyes and with a sweeping motion of his arms try to bring the index fingers of his two hands together, or to take each arm separately and have him touch his nose with the index finger. In static ataxia, the Romberg sign test is used in which the patient stands with his toes and heels close together with eyes closed and he is then observed for possible sway. The normal person can stand without swaying but the ataxia case sways and in violent cases may even fall. Asthma is occasionally found in children as well as in adults. Although it seems to have very obvious physical symptoms such as coughing and choking, there is substantial evidence that basically asthma may have a psychogenic origin.

Any psychologist experienced with various types of motor-coordination tests realizes the extreme range of motor coordination found among children. Some of them are extremely adept in muscular control, others show marked disabilities. In extreme cases diagnosis should be pursued further, with medical assistance, to determine if any of the various types of motor disorders are reflected in these poor test performances. Teachers who observe poor coordiation in children should also be aware of the possibilities of fundamental motor disorders and not merely excuse the problem as being unusual awkwardness.

This entire field has tended to be overlooked from an educational point of view, but is certain to assume more importance in the future with advances of medical knowledge and greater emphasis for better emotional adjustment of children. Too often these various types of handicapped children have been incorrectly classified as malicious disturbers in school, nuisances in their neighborhoods, and as heartaches for their parents.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Describe a case of chorea and its treatment.
2. Review the chapter on Speech Defectives with particular reference to motor disturbances.
3. Describe a case of athetosis; one of ataxia.

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B. ORGANIZATIONS

1. American Orthopsychiatric Association, New York
2. American Psychiatric Association, New York

C. PERIODICALS

1. *American Journal of Orthopsychiatry* (quarterly) by the American Orthopsychiatric Association
2. *American Journal of Psychiatry* (monthly) by the American Psychiatric Association

Part V

Behavior Adjustments

INSTITUTE OF EDUCATION FOR WOMEN
Dept. of Extension
SERVICE.
CALCUTTA-27

Chapter XXII

TYPES OF BEHAVIOR

In Part V the topic of behavior will be discussed. The behavior of children at home and in school has attracted more interest in exceptional children than in any other type, and as much as the combined total of several other types. The reasons are obvious: overt malbehavior disturbs classes and upsets the routine of the school and the home. It also disturbs the composure of parent or teacher. It is erroneously considered as capable of being self-controlled by proper will power and hence is deemed needless and unnecessary.

General Considerations

Malbehavior arises from conditions within the child or from external influences whose effects are not often noted or understood by others. Whereas a condition of total blindness is an obvious reason for the major behavior of the blind individual, the emotional and psychological factors in the apparently normal or nonhandicapped child are neither readily seen nor understood. Liberal allowance is likely to be made for the blind child but not for the malbehavior case. Such allowances are also made for many other types of physical handicaps. In recent years allowances for mental handicaps are more likely to be made than formerly as a result of information from intelligence tests. On the surface, the malbehaved child seems to lack any basis for his actions. Modern child study has been developing methods of diagnosis and remedial treatment which serve the same purpose in behavior diagnosis as intelligence tests for mentality, or tests for visual acuity, in their respective fields.

Many kinds of malbehavior bring their subjects into the headlines for crimes against persons or property. An inspection of news headlines, even in wartime, finds a too liberal emphasis upon the delinquency phases of American life. Since many antisocial acts are committed by young adults who recently have left school, attention is directed toward the school as the place where delinquency should be recognized and remedied. The cost of crime, amounting to $15,000,000,000 annually, is a practical economic consideration. Only about one-fourth as much is spent on education. There is an obvious implication that if the two amounts could be reversed, much greater happiness and human efficiency would result.

In the present discussion the term "behavior" is used in a comprehensive manner to designate all types, ranging from acceptable to unacceptable. Psychologically, it is important to understand behavior at either extreme of acceptability. Various terms with unfortunate implications are used universally to designate unacceptable behavior. In the present discussion the term "malbehavior" has been used although it carries implication of guilt or badness. Most of the popular discussions are much less charitable with such terms as "bad," "criminal in the making," "utterly irresponsible," "the worst child I ever saw," and a host of others equally unfortunate.

From the psychological and psychiatric point of view behavior is not viewed as good or bad but as the natural result of basic underlying causes. When behavior is socially unacceptable, in the popular mind it is believed to be due to willful disobedience, to a desire to be different, and sometimes is labeled as a sin. These terminologies and their implications have confused the issue and delayed the day when the true nature of behavior motivations will be understood.

The diagnostic agencies are primarily interested in causes and mechanisms of behavior and with less concern about the actual behavior which is so disturbing to teachers and parents. On the other hand, teachers and parents concentrate their interests on the disturbing behavior and view as impractical the long-time program of remedial measures.

There are many types and varieties of behavior, particularly of unacceptable behavior. They vary from minor disturbances which have no deep-seated causes to acts of violence classified as crimes, steeped in mental conflicts and emotional tensions. The discussion of behavior in this chapter is divided into lists of behavior traits, classifications of symptoms, neurotic behavior, and delinquency.

Behavior Traits

In order to discover the nature and extent of behavior traits among elementary-school children a survey was made with an

TABLE XVI

FREQUENCIES OF THE BEHAVIOR ITEMS

Items or Traits	*Number*	*Per Cent of Maximum Possible Occurrence*	*Per Cent of All Items Occurring*
Interferes, disturbs	871	64.2	9.4
Argues, talkative	848	62.5	9.2
Fights, quarrelsome	810	59.7	8.7
Defiant, stubborn	647	47.7	7.0
Lies, deceitful	556	41.0	6.0
Bullies, boasts	549	40.5	5.9
Resents correction	520	38.3	5.6
Cruel, teases	473	34.9	5.1
Cheats in school or at play	469	34.6	5.1
Obstinate, sullen	465	34.3	5.0
Smart aleck	333	24.5	3.6
Impulsive, erratic	324	23.9	3.5
Daydreams, absent-minded	305	22.5	3.3
Overactive, nervous	295	21.7	3.2
Steals	292	21.5	3.2
Disliked, repulsive	252	18.6	2.7
Truant (school)	231	17.0	2.5
Temper tantrums, rage	204	15.0	2.2
Profane, vulgar, obscene	182	13.4	2.0
Selfish	135	9.9	1.5
Hysterical, cries	124	9.1	1.3
Quiet, seclusive	97	7.1	1.0
Truant (home)	97	7.1	1.0
Sex abuse	87	6.4	0.9
Avoids others, timid	84	6.2	0.9
Sets fires	14	1.0	0.2
Totals	9264	——	100.0

alphabetized list of items in all the Detroit elementary schools in June, 1929. Twenty-six items were included and a total of 1357 children, or approximately 1 per cent of the total enrollment, was reported with about 85 per cent boys and 15 per cent girls. There was an average of 6.8 items per pupil, and about 7 pupils per school.[1] The list of items with their frequencies are shown in Table XVI.

TABLE XVII

TOTAL INCIDENCE AND FREQUENCY OF HABITUAL INCIDENCE IN 874 PUPILS OF A CLEVELAND SCHOOL

Type of Problem	*Per Cent of Incidence in 874 Pupils*		*Type of Problem*	*Per Cent of Incidence in 874 Pupils*	
	Total Incidence	*Frequency or Habitual Incidence*		*Incidence*	*Frequency or Habitual Incidence*
Whispering	74.7	41.0	Fearful	9.3	1.8
Inattentive	59.0	29.1	Physical coward	8.8	1.2
Careless in work	44.4	23.9	Nervous	8.7	3.5
Tattling	42.0	11.5	Willfully disobedient	8.2	3.7
Disorderly in class	38.8	18.4	Destroying property	8.2	1.2
Interrupting	38.7	18.6	Unhappy, depressed	8.0	1.4
Failure to study	36.2	17.5	Quarrelsome	7.9	2.5
Shy, withdrawing	35.2	18.2	Stubborn in group	7.5	1.8
Daydreaming	33.4	13.5	Rude, impudent	6.7	3.8
Lack of interest	31.8	10.8	Impertinent, defiant	5.6	1.7
Overactive	30.9	16.5	Carrying grudges	4.9	0.8
Cheating	29.5	8.7	Stealing articles	4.0	0.6
Oversensitive	25.2	8.3	Masturbation	3.9	0.9
Neglectful	25.4	9.9	Enuresis	3.9	0.8
Physically lazy	20.8	10.7	Sissy (or tomboy)	3.6	1.2
Lying, untruthful	19.6	3.3	Suspicious	2.1	0.3
Unnecessary tardiness	17.6	3.5	Cruel, bullying	1.7	0.7
Acting "smart"	14.6	7.4	Profanity	1.7	0.0
Overcritical	14.2	5.3	Truancy	1.6	0.2
Imaginative tales	13.3	3.7	Temper outbursts	1.5	0.3
Meddlesome	12.6	4.2	Stealing money	0.7	0.3
Sullen, sulky	12.5	2.5	Stealing food, sweets	0.7	0.2
Domineering	12.1	5.9	Obscene notes, talk	0.3	0.0
Slovenly appearance	11.8	4.8	Smoking	0.2	0.1
Suggestible	9.4	4.5			

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[1] H. J. Baker and V. Traphagen, *The Diagnosis and Treatment of Behavior-Problem Children*, The Macmillan Company, New York, 1935, pp. 370–377.

There is a greater preponderance of aggressive behavior than of recessive although the latter is known to have much more significance in many cases. From the standpoint of the teacher and parent it is less disturbing and hence is accepted with relief rather than with the alarm it should receive.

A slightly different approach was made in the analysis of 874 pupils in one Cleveland school in which the teachers reported behavior without the use of a check list. This study is reported by Wickman [1] and includes more items than the Detroit study. It is shown in Table XVII.

It is interesting to note that whispering leads the list of behavior items. In some situations whispering is not considered as a behavior maladjustment, because in some classrooms a certain amount of conferences between pupils is not considered undesirable and may even be encouraged.

A somewhat different type of list was compiled by Sherman [2] in an investigation conducted by parents of good intelligence who carried notebooks for one week in which they recorded acts of their children which annoyed them. They listed 51 separate items, with a total of 2124 times. The main results are shown in Table XVIII.

It may be noted that the type of items is somewhat different

TABLE XVIII

ANNOYANCES OBSERVED BY PARENTS

Description	*Number of Times Recurring*	*Per Cent*
Noises and interruptions	380	17.9
Disobedience	304	14.3
Bad manners	154	6.6
Slowness, laziness, tardiness	137	6.4
Untidiness	126	5.9
Restlessness	112	5.2
Physical annoyance to others	98	4.6
Dirty habits	89	4.1
Bad humor, crying, temper	70	3.2
Teasing	69	3.2

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[1] E. K. Wickman, *Children's Behavior and Teachers' Attitudes*, The Commonwealth Fund, New York, 1928, p. 30.

[2] M. Sherman, *Basic Problems of Behavior*, Longmans, Green and Company, New York, 1941, p. 334.

from the two preceding tables in which teachers reported behavior of children in school. The list from parents may not be typical of children's behavior generally because the parents were of "good" intelligence and many of these descriptions were of a minor nature. In less favorable homes a much more severe type of behavior would probably be reported. Many of the items of the present list would not be considered serious. Parents in various types of neighborhoods with different cultural and economic status present many discrepancies in points of view about behavior.

Classifications of Behavior Problems

Behavior deviations may be classified from many points of view so that any standard classification is practically impossible. Classifications by teachers are different from those of diagnostic agencies, since the latter are more interested in fundamental causes than in the behavior itself. Within the diagnostic agencies themselves there are different points of emphasis. In school clinics reasons for school failure, truancy, general disturbance of the class, and disobedience of school rules occupy the center of attention. Clinics which are not associated closely with schools but with the general public find their interests in problems of eating and sleeping, enuresis, jealousies, lack of orderliness, and general uneasiness from not having enough activities to occupy the children's time. Clinics in connection with juvenile courts must deal with stealing, burglary, gross truancy, sex offenses, and other grave delinquencies.

Ackerson[1] noted a distinction between behavior problems and problems of personality. Personality problems which affect others to some degree may be considered behavior problems. Recessive or withdrawing behavior, which mainly affects the individual himself, is an example of a personality problem. Lying, which may injure others, often has personality problems behind its motivation. It is also considered a behavior problem.

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[1] L. Ackerson, *Children's Behavior Problems*, University of Chicago Press, Chicago, 1931, 268 pp.

Another classification of problems may be made from the point of view of attitudes between individuals. When two individuals are well adjusted or a family has generally satisfactory attitudes, many minor problems of behavior are minimized or ignored entirely. However, where attitudes and relationships become strained, slight maladjustments become intensified because of a general attitude of intolerance. While these conditions are more directly related to causes than to the behavior itself, the behavior is either minimized or intensified depending upon the general attitude.

Problems by age. Children's problems are different according to their age. Sherman [1] notes that in young children there are five main types: eating, temper tantrums and negative behavior, dependent or babish behavior, sex and toilet habits, and dominant and pugnacious behavior. With adolescents there are likely to be feelings of inferiority, argument, truancy, and other acts of a generally antisocial nature. There are likely to be misconceptions about the frequency of behavior problems at different ages because schools and parents are often more aware of the extreme problems of older children and hence they ignore or discount those of young children.

Problems by intelligence. One of the most commonly investigated relationships is that between behavior and intelligence. In the first years after intelligence tests came into general use, many delinquents were examined and found to be low in intelligence. It was incorrectly assumed that behavior was highly correlated or parallel to intelligence, with the greatest frequency in the levels of feeble-mindedness. Subsequent studies of behavior problems show the peak of the distribution to be about I.Q. 85, or in the dull or slow-learning group rather than in the feeble-minded. The distribution tapers off both ways from this peak down into the feeble-minded and up through the average group with a small number among the superior and gifted. Types of antisocial behavior are discovered in school in which school failure may be the main point of emphasis. Children of different mental levels undoubtedly have problems of personality which are not always studied so intensively as are school maladjustments. In the 1929 Detroit Behavior Survey bright children were worse than dull ones in situations in which they could use their superior intelligence to greatest advantage by showing off, by interfering with others, by arguing, being talkative, by bullying, and by boasting. By contrast, the dull cheated, fought, were generally quarrelsome, and manifested various behaviors in which they expressed themselves more directly in physical rather than in mental action.

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[1] Sherman, *op. cit.*, pp. 334–336.

The greater frequency of behavior disorders among the dull may be explained in that they are bright enough to know how to make trouble but not bright enough to foresee the possible consequences. Brighter children generally are able to foresee consequencies which may act as a partial deterrent, whereas the feeble-minded do not have enough mental initiative to get into much trouble except by the suggestion and leadership of the more capable. There are probably attendant circumstances to explain why dull individuals are more susceptible to behavior disorders than any other group; their social backgrounds are generally poor, their homes have less favorable ideals, and there are many other closely related factors. Those who believe that intelligence is the most important factor in behavior are referred to Table XII on pages 350–351 of Baker and Traphagen's [1] *The Diagnosis and Treatment of Behavior-Problem Children* in which intelligence is twenty-first in order of the sixty-six items in differentiating between behavior and nonbehavior children. In other words, there are nearly one-third of the items which make a more definite sorting than intelligence.

Variety of motivations in behavior. Although general motivations will be discussed in a later chapter it should be stated that there are many varieties and types of any particular behavior. For example, Burt [2] classifies lies into seven kinds: playful or make-believe lies; the lie of confusion from inability to distinguish between fact and unreality; the lie of vanity to attract attention; the lie of revenge; the exculpatory or conscious lie often based on fear of more serious consequences if the truth becomes known; the selfish lie to gain immediate or personal profit; and the lie of loyalty to shield someone else. It may be noted that these types of lies have various kinds of motivations and bases, such as mental immaturity, emotional disturbances, and unusual social situations. Obviously there is no single cure or treatment for lying, and purely punitive measures of a general nature have little effect upon the practice.

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[1] H. J. Baker and V. Traphagen, *The Diagnosis and Treatment of Behavior-Problem Children*, The Macmillan Company, New York, 1935, pp. 350–351.

[2] C. Burt, *The Young Delinquent*, D. Appleton-Century Company, Inc., New York, 1931, pp. 361–365.

Neurotic Behavior

In an earlier chapter psychotic conditions were presented with their causes mainly of neurological and psychogenic origin. In the present section neurotic behavior will be discussed as a classification of behavior. Neurotic behavior is a misnomer, since it is ordinarily not based on neurological conditions, but is primarily of psychogenic origin. Some relationship may exist between neurotic behavior and neurological conditions, even without any physiological defect or atrophy of the nervous system. It is probable that a general neurological weakness and a greater susceptibility to nervous strain may be in the background of neurotic behavior. Children are not generally susceptible to neurotic behavior, but it occurs in certain forms, and a few of them will be discussed.

Anxiety neuroses are commonly caused by continual failure to reach some goal, such as the conflicts of childhood, adolescence, and adulthood as will be noted in Chap. XXIII. Anxieties may take several forms such as inferiority complexes, great irritability beyond what should usually be expected from mild incidents, indecision with great procrastination about whether to make rash judgments and actions, morbid tensions with the face drawn and rigid, attended by insomnia and continual weariness, and a feeling of impending doom. A few children obviously suffer from anxiety neuroses because they show many of these symptoms, usually in modified form but sometimes in extreme form.

Hysteria is a second form of neurotic behavior in which the patients are very sensitive and suggestible. Partial or complete blindness and partial or complete paralysis sometimes occur. Anaesthesias are characteristic of hysteria. It is rather difficult to distinguish some of these conditions from those with physiological causes, except that when proper motivation is provided the hysterical behavior suddenly disappears. Fainting in the midst of some acute crisis might sometimes be associated with hysteria. It often occurs at the most awkward moments.

Neurasthenia is characterized by continuous complaints about bodily illnesses and a generally too intense preoccupation with one's health. These imaginary illnesses and conditions serve as convenient excuses and alibis for failure to do necessary but unpleasant tasks. Another outlet for the neurasthenic is to cultivate such symptoms as a topic of conversation or opportunities to establish his extreme significance above all his associates. In a recent blackout a neurasthenic was fined for violation because he insisted that at a stated time each night he must make himself a cup of tea, and arguments by the air-raid warden were to no avail. Neurasthenic behavior is also associated with sexual abuses such as masturbation, accompanied by rapidly recurring cycles of indulgence and remorse.

Psychasthenia centers around the dilemma of making decisions, but with longer and more morbid effects than in the case of anxiety neuroses. The person may brood for years over some decision, and set up all manner of acts for atonement. Some of the more morbid fears, such as of high places, fear of dirt, fear of poison, and many others may be classified under psychasthenia.

There are also mixed neuroses in which complicated symptoms arise from combinations of those which have just been noted. Some children who are not actually affected with such forms of neurotic behavior may nevertheless show them in school. They have unconsciously adopted them by imitation from their parents who have them in active form.

Other unusual forms of behavior. One of the most difficult problems for the average person is to distinguish between normal and abnormal forms of behavior. As a matter of practical consideration the progression from normal to abnormal behavior is a gradual process with no more of a marked line of difference than that separating people of average height from short ones. Extreme forms of unusual behavior are probably based upon psychopathic personality or possibly on psychotic behavior. An example is unusual love for domestic animals. In extreme forms, such an individual usually lives alone and gradually gathers a whole houseful of cats or dogs, and spends his or her entire life interest as well as limited means on them. In terms of social standards such an extreme practice is considered unusual; whereas one or two cats for moderate pastime is usually considered normal. The individual who raises many dogs or cats for show or breeding purposes is within the limits of usual behavior although the number of his livestock is large.

Fetichism, or love for some particular object, is another extreme form of behavior, in which the person gets a strong attachment to a lock of hair or similar object. There is a difference between true regard as may be expressed in such a sentiment and hours of wishful thinking when surrounded by such objects. Sadism is a form of behavior in which the individual delights in inflicting pain upon others, and this may take very unusual forms such as are depicted occasionally in moving picture and drama. Masochism is an allied type in which the individual delights in having punishment inflicted upon him by someone else. It might be speculated that when children are impelled to unacceptable behavior in anticipation of inevitable punishment that masochism is at the seat of the trouble. This type of behavior is believed to be motivated by a desire to be punished for other misdeeds, although the one who is inflicting such measures may be unaware of the actual motivations.

There are several extreme forms of love which are frequently noted in children. The child who gets such an exalted sense of well-being that he falls in love with himself illustrates a mechanism known as Narcissism. According to legend, the youth, Narcissus, was such a person. He scorned the love and affections of others so completely that they had him condemned to sit by a stream and spend his life idly admiring his own image in the water. It should be stated that there is a distinction between Narcissism and self-esteem as well as pride in personal appearance both of which are ordinarily acceptable and desirable. Love may take the form of a child becoming too closely attached to a parent, usually of the opposite sex. These bonds become so strong that marriage is even contemplated by the child. The Oedipus complex in Greek mythology is such an example in which Oedipus was supposed to have had such a strong love for his mother that eventually he slew his father, Laius, and married Jocasta, his mother. Both of his parents were strangers to him since he had been cast out in childhood. The affair finally ended in the oracle disclosing the true state of affairs, and for this crime against society, his mother hanged herself and Oedipus put out his own eyes.

Another form of abnormal love is homosexuality in which there is love for a person of the same sex. This phenomenon is believed to be an escape from the reality of facing marriage, or in children it may be a mechanism by which they may escape a distasteful competition with those of the same sex. Boys simulate feminine dress and mannerisms, and girls do the opposite.

It remains a crucial question whether or not such unusual trends could be prevented if recognized and combated in their early stages, or whether there was some weakness of organic structure from which the person inevitably could not escape. Many of these symptoms are probably the result of frustrations in the general motivations to be described in Chap. XXIII. Mere punishment or similar measures when the advanced stages are reached are probably not effective therapeutic measures.

Delinquency

There are certain extreme kinds of malbehavior which are termed "acts of delinquency." They are sufficiently grave to come to the attention of police and juvenile-court authorities, although some offenders are not apprehended. There are many adolescents and young people who commit such acts entirely outside of school hours and not involving school situations. In a recent conference with juvenile-court authorities it was stated that only in about one-tenth of the cases currently known to that agency did the schools have knowledge of any trouble. It is one of the vital questions in solving delinquency whether or not schools should be made aware of these offenses, with the general concensus of opinion that until the schools are able to provide more helpful remedial programs, there might be more loss than gain in such knowledge. Theoretically the school should be one of the most helpful agencies, cooperating with the courts and police. There is a gradual and hopeful trend in that direction.

The types of offenses committed offer an interesting list. Gluecks'[1] study of a thousand delinquent boys gives a list of offenses with the number of each, as shown in Table XIX.

TABLE XIX

Offenses	*Number*
Larceny and similar offenses	505
Burglary and similar offenses	231
Stubbornness (including waywardness, disobedience)	107
Running away from home	46
Truancy	30
Assault and battery; disturbing the peace	24
Trespassing and similar offenses	10
Sex offenses	9
Gaming, or being present at gaming	7
Various other offenses	31
Total	1,000

In a report of 10,000 cases in Greater New York City the distribution was stated in somewhat different terminology, but results were mainly similar, with stealing or larceny in first place. Incorrigibility at home or in school stands about third in both lists, although it is seemingly of less serious social significance at the immediate time as stealing or burglary.

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[1] S. Glueck and E. T. Glueck, *One Thousand Juvenile Delinquents*, Harvard University Press, Cambridge, Mass., 1939, p. 100.

The boys usually outnumber the girls about six to one in most juvenile courts. Their offenses are in a different order of frequency with sex offenses, incorrigibility, and stealing among the most frequent.

Since most of these problems are at an acute stage by the time they reach the police and the courts, there is comparatively little which regular school programs can do for them. However, there is need for adjustive agencies in the schools, with the courts and the community working together on their solution. The greater challenge is to have a program of early prevention so that such extreme offenses shall not be committed.

Relationship to Motivations and Causes

In the present chapter various types of behavior have been discussed from many points of view, in order to show the complexity of behavior problems. These examples of unacceptable behavior arise from phases of motivation and frustration with their attendant and resulting conflicts. While it is possible to trace a very direct connection between some types of behavior and the motivations, in many cases the problems become very involved with other issues and the relationships are not so easily traced. More intensive case study and treatment are needed. It is also possible to relate behavior disorders to the specific causes cited in a later chapter. When these causes are corrected, such as defective vision, tensions may be relieved with improved attitudes toward home and school, resulting in the disappearance of the unacceptable behavior. It cannot be stated with certainty that the vision correction is the direct cause of improvement, but it is at least an indirect cause and if improvement eventually comes through these allied channels, the main purpose is achieved.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Classify the items of Tables XVI and XVII with respect to aggressive versus regressive behavior.
2. What types of behavior in children disturb you most as a teacher?

3. Contrast neuroses with psychoses as discussed in Sherman's *Basic Problems of Behavior*, Chaps. IX and X.
4. Visit the juvenile court and note the discussions and disposal of cases.
5. Visit various child-guidance clinics and note the types of behavior cases referred to them.

Chapter XXIII

THE MECHANISMS OF BEHAVIOR

Behavior traits are important issues in the eyes of parents and teachers. For students of behavior they are less significant than the mechanisms from which the behavior arises.

The difference in point of view may be illustrated from the physiological field. A high body temperature, indicating fever, is usually the result of an infection. If it were treated according to the popular attitude toward malbehavior, the temperature itself would be the center of interest, as is a behavior outburst of cruelty or destructiveness. Efforts to reduce the temperature might be purely objective in character such as haranguing the patient to reduce his temperature by sheer will power, encasing him completely in ice packs, or plunging him into a cold bath. Obviously the modern point of view is to discover and treat the cause of the temperature, so that it may eventually be reduced. At best a high temperature is only an external sign of internal trouble, hence symptoms and basic causes are quite different and located in entirely unrelated areas.

In like manner malbehavior should be considered parallel to the high temperature and hence a symptom of some deeper, underlying cause. Rather than the usual custom of concentrating upon the malbehavior itself, attention should be directed to causes and how they operate to produce the external results. This procedure is much more logical than the futile but popular practice of repressing and restraining malbehavior.

In the treatment of malbehavior, attention should be focused upon the underlying causes and how their mechanisms operate to produce the malbehavior. In the present chapter the motivations of human conduct will be discussed with special reference to conflicts which arise to thwart motivation.

The effects of thwarted motivation upon the integration of the total personality will also be described. The motivations of conduct and integration of personality described in this chapter are a general pattern which may be applied to practically all types of behavior either acceptable or unacceptable. In Chap. XXIV the more specific and basic causes as well as methods of diagnosis will be presented and Chap. XXV will discuss remedial and preventive measures.

Motivations of Human Conduct

Motivation is a vital force in human behavior. It pervades the life and activities of children as well as adults. Motives may be strong or weak, worthy or unworthy, physiological or psychological. They may be fulfilled or thwarted or show any degree between these extremes. When they are frustrated, various types of reaction may occur, ranging from submissive acceptance to vigorous rebellion. Furthermore, any degree of frustration may yield entirely different reactions in two individuals, depending upon their unique constitution. Different reactions may occur in the individual at different times depending upon his mood and other factors.

Writers in the field of motivation ascribe great importance to it, although there is lack of uniformity in their classifications of motives. In the early days the term "instinct" was often used and with direct comparisons to the instinctive life of animals. This similarity to animals was not too graciously accepted in many quarters since there also were known to be many motivations in human affairs much beyond the interests and scope of instincts in animals. The present writer prefers the term "instinctive drives" or preferably "unlearned" behavior. Other substitute terms have been proposed such as "propensities," "desires" and "motives." They are generally better controlled in adults than in children.

Dunlap [1] proposed a list of nine instinctive desires including food and drink, excretion, protection, activity, rest and relaxation, amorous desires, parental desire, preeminence, and conformity. Shaffer[1] classifies eight motives: subsistence motives, motives arising from emotional tensions, mastery motives, social approval motives, conformity motives, sex motives, habits as motives, and mixed motives. His list covers most of Dunlap's list of nine desires but with slightly different titles.

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[1] K. Dunlap, *Civilized Life*, The Williams & Wilkins Company, Baltimore, 1934, pp. 61–106.

Other authorities stress additional phases or special phases of the two lists noted above. Freud placed his emphasis upon satisfaction drives which he believed were carried out mainly below the level of consciousness. The entire field of psychoanalysis, built around Freudian psychology, has had very popular usage but along with it much criticism and opposition. Alfred Adler found that motivation for overcoming inferiorities was the chief keystone to human behavior. Jung believed that individuals sought a high level of perfection and satisfaction with life as their chief motivation.

The present writer has attempted to summarize these ideas under the topic of motivation leading to self-realization. In his book *The Art of Understanding*[2] motivations at three levels are discussed—childhood, adolescence, and adulthood—in consecutive chapters. In childhood there is strong motivation toward self-preservation and toward self-realization marked by many clashes and conflicts to a wider social point of view by parents, teachers, and other adults. The child believes he will reach greater self-realization along narrow and restricted lines, whereas society tries to teach him otherwise.

In adolescence the general motivation toward self-realization is the same, but it is characterized by a conflict to free oneself from childhood restrictions and become a full-fledged adult. In adulthood, self-realization is a strong motive which gradually becomes modified into self-realization through the success of one's children. The conflict between wishful thinking and reality is one of the chief characteristics of adult life. Life passes from crisis to crisis, and from episode to episode, but with the same general underlying theme of solved or unsolved conflicts.

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[1] L. F. Shaffer, *The Psychology of Adjustment*, Houghton Mifflin Company, Boston, 1936, pp. 100–108.

[2] H. J. Baker, *The Art of Understanding*, The Christopher Publishing Company, Boston, 1940, pp. 111–142.

Conflicts in Motivation

At all age levels from childhood to senility conflicts arise which thwart this general motivation and all of its subphases such as listed by Dunlap, Shaffer, and others. These conflicts follow the same general plan at all age levels. On the one hand, there is a main motivation with a line of purpose, desire, or internal urge to reach a specified goal, but on the other hand opposition arises at various intervals. In childhood the toys must be shared, the choicest morsels of food must go to others, consideration must be shown toward the family and the class, and in hundreds of ways social goals rather than purely individual interests must be served. While many children accept this point of view with grace, or gladly in some instances, a large number find a continual source of mental conflict to which they do not adjust satisfactorily. The stage then becomes set for plenty of trouble as will be shown later.

In adolescence the conflict continues with the same pattern but with different circumstances. The youth struggles to free himself from the psychological pattern of childhood which is marked by decisions forced upon him by parents, teachers, and others. He strives for a psychology of adulthood in which he hopes to reach self-realization through his own judgments and decisions. The conflicts of this three- or four-year period are sometimes beyond description. The parent believes that the adolescent is still too young, or that he has not yet shown very mature judgment, and hence requests are denied. His own judgment dictates otherwise, and he believes that in today's world, which is different from yesterday's, he is in a better position to decide. Since he needs practice in making judgments and choices, there should have been such opportunity along these lines during childhood. Too frequently his parents have overlooked the future and found it easier to do all of his planning themselves. It is probably no more logical to expect an adolescent at fifteen years of age to suddenly begin making his own judgments without practice, than to expect finished performance on some musical instrument at that time without earlier practice and instruction.

The conflicts of adulthood follow the same pattern but with many different types of circumstances. Conflict arises in a world of keen competition over vocational choices, marital problems, investments, and a host of other factors. The reader is referred to the author's *The Art of Understanding* for more details.

It should not be assumed that all conflicts are necessarily bad or accompanied by disastrous consequences. Conflicts are the stuff of which life is made and strength is often developed by facing conflicts, learning how to master them, and how to make adjustments graciously. Since conflicts become causes of malbehavior in problem children, their importance in milder degrees with normally behaved children has too often been discounted and overlooked. A good mental hygiene program for such cases would yield a profitable return.

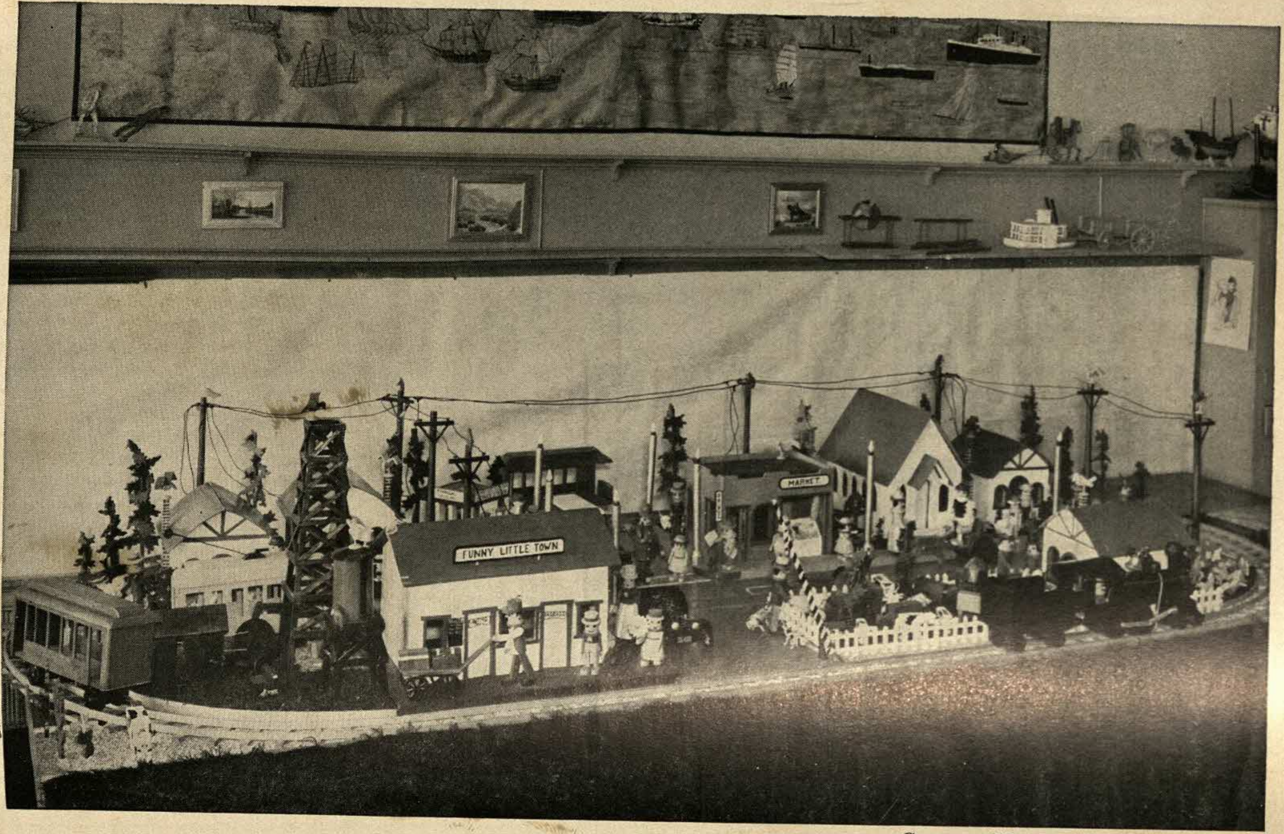
Effects of Conflicts

A conflict has a characteristic pattern of effects upon behavior and upon emotional life regardless of at what age it occurs or the extenuating circumstances. There are two courses of possible action: the preferred one is tabooed or forbidden, the other is not acceptable to the child himself. In such a dilemma solutions become well-nigh impossible. There are many types of response or reaction. The normal reaction is to make the best of whatever solution seems feasible, but unfortunately this does not always occur. The typical reaction is to become indifferent and lose interest in either choice, with a blunting of emotions. A world of phantasy or wishful living results. This pattern has many schizophrenic symptoms. Adolescent schizophrenia is believed caused by it. Other types of reaction are violent rebellion, temper tantrums, and allied forms of aggressive behavior.

In any event, the unsolved conflict stirs up emotions and feelings. This upheaval temporarily overwhelms reason, logic, and intellectual processes. A similar phenomenon is familiar to practically everyone when extreme excitement, great sorrow, or unusual fear outweigh the intellect for brief periods. During such times it is practically impossible to give undivided attention to mental work. Adults usually find excuses to postpone

Courtesy of Cleveland public schools

Class discussion, major-work group, Cleveland public schools.



Courtesy of Los Angeles city school district

Little mechanical town made by a younger class of socially maladjusted boys, Los Angeles city school district.

mental tasks until a more favorable time. However, children's difficulties are not always recognized and hence they are disciplined for inattention at school, adding insult to injury. Many children of proved mental ability have often been believed mentally retarded by their teachers whereas the real problem is ineffective mental functioning due to emotional blockings. In order that intellectual processes may function efficiently at any level of I.Q. there must be reasonable freedom from emotional conflicts. Unfortunately, this is not always the case.

The conflicts at all age levels follow the same general pattern and have the same general effects. There is a conflict of motives and a forced choice. Sometimes these choices are simple, direct issues, more often they become involved with subchoices or alternates which add complications to basic troubles. There are unanticipated consequences resulting from decisions which add to the intensity of the feelings and emotions.

The Integration of Personality

Motivations arise from many sources and in order to understand behavior it is necessary to study the child as a complete organism. Such a general statement has often been made in educational literature, but often with little meaningful interpretation. The whole child includes a vast array of interests as comprehensive as society itself. Social life, psychology, physiology, exceptional children, and a host of other interests must be understood in and of themselves and in their relationships to each other if the whole child is to be understood. It is much easier to ignore such concepts and study each phase of childhood by itself with only vague reference to other factors. The teacher finds it easy to emphasize the intellectual side of learning although the modern school program is trying to widen its interests into a much more comprehensive picture. At home there is emphasis upon the physical aspects of food, clothing, and shelter, with neglect of emotional factors. There is necessarily specialization in many fields touching child life with the dentist, the family doctor, the specialist, the dancing teacher, the music teacher, the Scout leader, the Sunday-school teacher, all dealing with certain phases of child life. All of them find it difficult to deal with the whole child.

In spite of these specializations the child is not divided up into many compartments, but, on the contrary, all of these individuals and experiences become parts of a comprehensive whole. The parent evaluates the child in terms of what he has offered him, but the child responds to that plus the influences of other people of which the parent may not be aware. The teacher judges him in terms of what she has offered and is puzzled by his behavior and interpretations which do not coincide with her offerings. All persons dealing with the child must realize that he is the product of many experiences rather than merely those which any one particular individual has provided.

The term "integration of personality" is commonly used among the child-study agencies, psychologists, psychiatrists, social workers, and counselors. Sherman[1] states that "the term 'personality' is generally used as a *concept* of the organization of a large number of traits in an integrated pattern." In his definition the phrase, "a large number of traits," merits special consideration since it is one of the stumbling blocks to a practical plan of understanding the personality. The chief question revolves around how many traits there are, and how they are organized into a total integration of personality.

As regards the number of traits, if many are used descriptively, a great amount of information is gathered about the child; but there is also the compensating difficulty of trying to organize it into a meaningful whole. If a very few trait names or areas are used, the description becomes too sketchy and inadequate. As an illustration of many traits, Allport and Odbert[2] made a listing of 17,953 words which they believed could be used as trait names. Their list was selected from among the approximately 400,000 separate terms or derivatives in the 1925 edition of Webster's *New International Dic-*

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[1] M. Sherman, *Basic Problems of Behavior*, Longmans, Green and Company, New York, 1941, p. 108

[2] G. Allport and H. S. Odbert, "Trait-Names, a Psycho-lexical Study," *Psychological Monographs*, 1936, 47, 171 pp.

tionary and comprises about 4 per cent of all words. They divided the list into four categories as follows: neutral terms and designated possible personal traits, temporary moods or activities, social judgments of personal conduct, and a miscellaneous group of physique, capacities, and developmental conditions. This list is not a very practical basis of approach, but it contains a wealth of details affording limitless opportunity for further study and research.

The present writer has proposed a framework of ten terms or areas, integrated together into a pattern to embrace the main features of an "integration of personality." It appears in his *The Art of Understanding* [1] but is reproduced here for convenience in Diagram V.

Pattern of Personality Integration

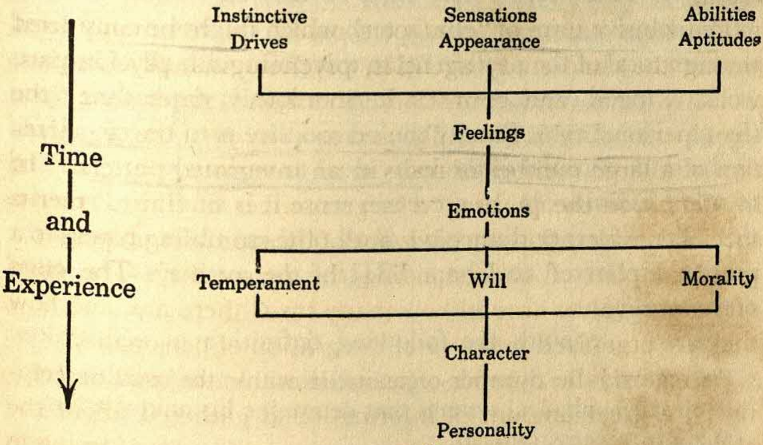

DIAGRAM V

The nature and importance of instinctive drives have already been presented earlier in this chapter. Sensations and bodily constitution with their importance for successful adjustment have been discussed in a comprehensive manner in Part II of the present volume, and abilities and aptitudes in Part III. These three areas may be considered the basic inventory with which individuals are equipped for the journey of life. Obviously many details could be developed under each of them.

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[1] H. J. Baker, *op. cit.*, pp. 83–97.

At this point the concept of time and experience is introduced as a dynamic feature of integration, since integration is affected either favorably or unfavorably with the passage of time and by experience. As time passes and experiences occur, feelings may arise from any of the three areas in the basic inventory, such as the inconvenience of hunger, an unpleasantness of strong light, the pleasure of accomplishing some feat such as unusual musical aptitude. Feelings may be considered as being quite temporary states which vary rapidly in daily routines as the scene of life moves along.

Whenever feelings become greatly disturbed so that bodily tensions and changes occur the term "emotion" is used. Long-time emotional tones lead into temperamental states, into the development of will, either positively or negatively, and into morality. These terms may then be carried further into the more inclusive term of "character" which might be considered the sum total of the pattern up to this point with all of its parts working together more or less harmoniously, depending upon the particular case. Finally the personality is to be considered as the total reaction of the individual to various situations and to other individuals. In a certain sense it is similar to reputation. For a further discussion of all of these traits or areas the reader is referred to Chap. VIII of the author's *The Art of Understanding*.

Allport[1] proposes the following definition of personality:

> Personality is the dynamic organization within the individual of those psychophysical systems that determine his unique adjustments to his environment.

Ordinarily the total pattern works together in a harmonious manner throughout the passage of time and through most of life's experiences. When distortions occur in some area, such as blindness, compensating distortions are likely to occur elsewhere such as in will power.

In order to understand fully the implications of integration it is necessary to have adequate diagnosis in each of the three basic areas and to know what reactions are likely to result from abnormalities and distortions. As a general principle, if personality is to be well integrated there should be no serious deviations among the basic areas of inventories. If such distortions occur, all possible corrections should be made. If complete restorations are not possible, it is imperative to give the best types of education and psychological training so that the personality pattern should be as well integrated as conditions will permit.

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[1] G. W. Allport, *Personality, A Psychological Interpretation*, Henry Holt and Company, New York, 1937, p. 48.

This outline has many implications for education. The importance of time and experience as moving or dynamic factors has been emphasized throughout the discussion. Time and experience include education. As a general theory it is believed that the basic factors are not very susceptible to change, but it is hoped that changes and improvements are possible in all of the other factors. Whenever schools emphasize the importance of aims and objectives, the first major goal of self-realization is closely related to the integration of personality. It has often been observed that the various objectives are very worthy, but the crucial test of education comes whether or not these objectives are realized in a practical and effective manner.

The present outline of factors with the relationships to each other is largely a matter of individual subjective opinion, but in many years of clinical experience this type of framework has been a practical guide to a better understanding of the entire child. Undoubtedly, with the improvement of measurements in all of the areas and in methods of studying interrelationships a more nearly accurate pattern may be developed. At present, this pattern is a useful antidote for anyone who would refer all maladjustments to one specific cause, such as intelligence. It gives an over-all picture of the "integration of personality."

In addition to the motivations of a subtle character which have been presented, other and more obvious motivations should also be mentioned. Some minor infractions of socially unacceptable behavior arise from desires to tease, plague, and embarrass others. Other infractions arise from the direct instruction offered and encouraged by unscrupulous associates. In gang activities the overt behavior is motivated by these direct orders rather than by any subconscious desires, although the latter may have caused gang membership to be sought.

In evaluating malbehavior the worker should distinguish between the various types of motivation and plan the treatment accordingly.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Describe any case of malbehavior that you have known in the light of this chapter.
2. Report on statistics on the costs of crime, and analyze them into various activities and divisions.
3. Report on the theories of Freud, Adler, and Jung with respect to motivation.
4. Give some illustrations of conflicts in childhood and interpret with respect to the present discussion. Do the same for adolescence and adulthood.
5. Consult the extensive list of traits by Allport and Odbert and make a report on their study.
6. Report more fully on Chap. VIII of *The Art of Understanding* with respect to all the portions of the pattern of traits.

Chapter XXIV

BEHAVIOR CAUSES AND METHODS OF DIAGNOSIS

In the preceding chapter the mechanisms of behavior were outlined and a pattern for the integration of personality was presented. In the present chapter the causes of unacceptable behavior and methods of diagnosing these causes will be discussed. Since there has been a voluminous literature written on these topics, only the important features of various plans can be presented and with brief discussions.

In the main the chief problem in diagnosis is to explore the fields suggested in the previous chapter as the basic areas, namely, instinctive behavior, sensations, and abilities. It is then necessary to relate these disabilities and deviations to other portions of the total pattern. Some cause sets the stage for a conflict since it provides frustration in reaching a desired goal. For example, a weak heart, defective vision, or encephalitis may disturb the usual successes and competitions of childhood.

The Causes of Malbehavior

There are many causes of malbehavior, and likewise, there are many situations and conditions which produce acceptable behavior. There is a strong possibility that there has been so much emphasis and attention to the problems of malbehavior that the motivations of acceptable behavior have been neglected and overlooked. Nevertheless, it seems necessary at this point to devote major attention to malbehavior.

There are many variables operating in countless possible combinations as causes of acceptable or of unacceptable behavior. One of the most important variables is the general attitude or social relationship between the parties or individuals who are involved in specific situations. For reasons not too well understood, either in a general psychological way, or specifically by individuals themselves, basic attitudes develop between them, varying at one end of the range from complete acceptance to complete rejection at the other. The episodes of life which are necessarily pleasant or unpleasant, plus the general impression of liking or of not liking, or the observance of specific traits which are pleasing or displeasing, are factors which furnish the background from which general attitudes between individuals or groups gradually develop. Once they have been developed, all incidents and episodes are interpreted in terms of them. If the attitudes are generally favorable, extreme deviations from normally acceptable behavior or performance are likely to be glossed over and to be accepted without criticism, whereas if attitudes are generally hostile, excessively critical comments are made on achievements which would be generally acceptable as judged by usual standards.

This problem of general attitudes between individuals tends to complicate any systems or plans of specific diagnosis, since identical incidents are treated and solved in different ways by different pairs of individuals, depending upon their mutual attitudes. Poor scholastic marks received by one child in a family may result in extreme parental criticism, whereas equally poor marks of a brother or sister may be accepted without criticism, and even with parental explanation. Since such variations of attitudes about identical situations are known to exist, it is obviously fallacious to draw general conclusions about family reactions to poor scholarship. At best, some general trends of attitudes may be discovered by investigating a large number of families in which scholastic failures have occurred, but such findings cannot be guaranteed to produce identically similar reactions in every family. The same unpredictable outcomes are likely to occur in every type of situation or episode of everyday living.

To these comments about interpersonal relationships, there must be added the reactions of the individual himself to the specific problem or situation which he faces at any given moment. There is a great range of reactions to identical problems such as blindness. One blind person may show extreme will power and be able to demonstrate that blindness is no barrier to his success, whereas another blind individual may sink into self-pity and develop a feeling of complete dependency. While family attitudes undoubtedly play some part in these divergent philosophies, the character of the individual himself also makes its unique contribution to his outlook on life.

Methods of Discovering Causes

There are many kinds of agencies and groups which are interested in discovering causes and remedies for malbehavior. They approach the problem from many divergent points of view and arrive at different kinds of results. There is an encouraging trend that many of them are beginning to realize that the causes of malbehavior are manifold and, hence, require cooperation rather than competition if the complex motivations of human behavior are to be understood, and if satisfactory results are to be attained.

Historically, society raised but few questions as to the causes of malbehavior but concentrated upon punishment as the preventive. Legal procedures were supposed to play upon the fears of those who witnessed executions, attended ceremonies at whipping posts, and at other brutal rites, but actually, little was accomplished in this respect. Legal measures in a much more modified form still continue to exist, but they are gradually becoming tempered by the advice and counsel from other professions.

A second group of agencies has approached the problem of malbehavior by providing activities which keep the potentially maladjusted in good company rather than in bad, and by keeping their hands and their minds busy with constructive rather than with destructive projects. Religious, recreational, and community organizations have widely extended their good influences, but they continue to recognize that a few basically maladjusted individuals do not conform to their programs which are generally effective for most other individuals.

In more recent times, attention has become focussed upon the basic causes of malbehavior. The general medical profession has made great advances in research into the various areas of physiological diseases and disorders, while the special branch of medicine, known as psychiatry, has also investigated the subject of mental disease and disorder. Psychologists have become more actively interested in mental processes and in the mechanisms of both normal and abnormal behavior. They have also developed inventories of general and special abilities which give a more adequate picture of the learning difficulties of children. Social workers and teachers have observed behavior and, hence, furnish supplementary evidence for the more scientific diagnosis of the various specialists noted above.

The causes of behavior maladjustment are usually quite complex and, hence, all of the various agencies and professions have undoubtedly contributed to the methods of diagnosis and of treatment. Because of this complexity, no one group is able to meet the problem fully through the use of its processes exclusively. There has been a hopeful trend of pooling information from all the resources to secure a more adequate composite picture of malbehavior. In the early stages of original research and investigation, there were jealousies and counter-claims between professions as well as between individuals within professions, which now tend to soften and to disappear.

In all fairness to individuals and to different points of view in diagnostic work it should be stated that each has undoubtedly made a fine contribution to some phase of the field. From these many points of view a composite plan should be developed which is comprehensive enough to cover the possible factors in all fields. As a practical beginning for a needed wide point of view, the reader is reminded of the various personality and psychological characteristics of the physically handicapped as outlined in Part II.

Methods of Diagnosis

There are two important divisions of diagnosis: (1) gathering the important facts; and (2) evaluating their effects upon the behavior of the child. The first concern is about gathering the data and in which there are many practical considerations. Information about cases may range from a few simple facts which may be already known from brief acquaintance to a comprehensive history which has required many hours to develop. A brief history is not expensive in time or money, but it may yield little return, whereas the comprehensive report is very time-consuming and expensive but may yield much better results. In clinical work some compromise between these extremes is usually made for practical reasons.

Personality and adjustment inventories. One of the recent methods of gathering information about problems is the personality or adjustment inventory. At the levels of junior and senior high schools most of these are self-administering with the individual marking the items of his choice. The California Tests of Personality [1] extend throughout the range of elementary and secondary schools. The writer [2] has recently developed the Detroit Adjustment Inventory with vocabulary and items suited to the general abilities and interests of such pupils as well. It contains 120 items divided into 24 topics with 5 items each, in the general fields of health and habits, feelings and emotions, social adjustments, home adjustments, morality, and vocational adjustments. Problem children rate themselves on from ten to thirty of the poorest responses and give a wealth of details which may be scored and results made available before the worker has begun any individual contacts. Remedial suggestions are also available in all of these areas.

The general limitations of such tests lie in understanding the meaning of the vocabulary or comprehending the questions, or in putting their own individual interpretations upon them. There is often a theoretical but entirely invalid objection upon the part of those who have never used such tests that children will not be truthful. It is generally known that children's problems are so close to their lives that they can scarcely refrain from answering what applies to them. This situation is similar to the quite universal tendency of most individuals to unburden themselves about their problems even to strangers if they are encouraged to talk about themselves. As such tests are becoming more practical and cover more areas, their uses are certain to increase when economy of time and usefulness become more apparent. It should be understood that they are not an end in themselves but should be the basis for further interview by trained workers.

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[1] Available through the California Test Bureau, Los Angeles, Cal.

[2] Available through the Public School Publishing Company, Bloomington, Ill.

Case-history methods. In the case-history methods details are gathered from the parent, the child, the school, and other sources familiar with the child's problems and background. Various types of history blanks are used. Some use only a narrative form of written report which is an evolution of the story in a narrative form. There is difficulty in organizing the facts around topics, although the approach to the problem seems natural. An exact opposite procedure consists of a printed form with well-organized details which are checked for the items which apply. The worker has to read through a great mass of details which do not apply to the individual case, and taking the history, is, therefore, likely to become a cut-and-dried procedure. A third intermediary form provides a few headings with appropriate space for written comments. Although questioning may take place about certain key topics, any spontaneously given information should be recorded in the appropriate places at the time or transcribed there at the end of the interview. A case-study blank was formerly offered by The Macmillan Company in connection with Baker and Traphagen, *The Diagnosis and Treatment of Behavior-Problem Children.*[1]

There are three methods of summarizing findings from case histories. One of these is the ego-libido method advocated by Dr. Marian Kenworthy and described in Watson's *Children and Their Parents.*[2] The ego needs of the child include self-preservation and other factors which build up the individual on a personal basis. The libidinal factors have to do with love and affection of the individual for the family, their love for him, and membership in the social group. Facts from the case history are classified under ego or libido categories, sometimes with the same material appearing under both. There is a fourfold classification of data under each of the two main headings of ego and libido. In this classification, the material is divided into destructive and constructive and under each of these it is further divided into *minus* for unsatisfying to the individual and *plus* for satisfying. For example, a satisfying yet destructive libido influence is to have an older child take a younger one to school. This situation is satisfying yet destructive since the younger child does not develop a needed sense of independence. In the process of treatment there is an attempt to change conditions and factors from destructive to constructive, and from unsatisfying to satisfying. Watson illustrates the technique with ten detailed cases.

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[1] H. J. Baker and V. Traphagen, *The Diagnosis and Treatment of Behavior-Problem Children,* The Macmillan Company, New York, 1935, 393 pp.

[2] M. E. Watson, *Children and Their Parents,* F. S. Crofts & Co., New York, 1932, 362 pp.

A second method of organizing the case-history material is a component-factor method by Rogers.[1] In this method the material is grouped under eight headings as follows: hereditary, physical, mentality, family influence, economic and cultural, social factors, education and training, and self-insight. Seven clinical psychologists rated the material for each group which was finally assigned scale values from -3 to $+3$ or in general with seven steps, including zero. Rogers contends that there must be some such minimum outline or diagnostic and remedial work cannot proceed on a sound or scientific basis. It would seem to the present writer that mentality, education and training, and self-insight are in the main closely related to each other in the majority of instances and, therefore, the factors are loaded too heavily with mentality in three of the eight areas.

Baker and Traphagen[2] list sixty-six factors in their behavior scale as described in *The Diagnosis and Treatment of Behavior-Problem Children*. These factors are divided into six areas: health and physical, personal habits and recreational, personality and social factors, parental and physical factors of the home, home atmosphere, and school factors. Each of the factors is treated in considerable detail with key questions for children and parents, a half-page of additional questions and observations, a five-point plan of scoring, and a three- or four-page discussion of its importance, interpretation, and treatment. The scoring ranges from 1 or very poor to 5 or very good, and scoring is done with respect to how much influence any particular item appears to have upon adjustment.

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[1] C. Rogers, *The Clinical Treatment of the Problem Child*, Houghton Mifflin Company, Boston, 1939, pp. 40–60.

[2] H. J. Baker and V. Traphagen, *op. cit.*

The scale is designed to discover the specific causes behind maladjustment rather than emphasis upon total scores, although the latter are apparently very significant. In terms of total score, the range is from a minimum of 66 points to a maximum of 330. Well-adjusted children make a median score of 285 points, poorly adjusted children in segregated classes 205 points, with very highly significant differences between the medians. Subsequent to the publication of the book the authors have noted many cases between scores of 140 and 190 who have developed into very desperate criminals, gangsters, murderers, and other types of desperadoes. Total scores are undoubtedly of great significance but the main emphasis is placed upon the number and kind of specific factors with a view to appropriate remedial measures.

The typically well-adjusted child averages one score of 1 and two of 2 or a total of 3 in these two lower groups, whereas the poorly adjusted have an average of six rated 1 and twelve rated 2 or a total of 18 in these two lower groups. In contrasting eighteen unfavorable factors against three for the well-adjusted child, it might be stated that the poorly adjusted child has six times as many factors operating unfavorably as for the well-adjusted child. These ratios are true of medians so that the poorer half of the poorly adjusted have more than that number.

Areas of the Case History

Some comment should be made of the factors under the six main headings to show the scope of interests and activities which should be taken into account in a case-history background.

Health and physical factors. There are thirteen factors, including early and present health, diseases, accidents, defects of speech, vision, hearing, orthopedic conditions, size, motor control, convulsions, and nervousness. From this list it is evident that the health history of the child is very important, and a physical examination to determine the presence of any factors is strongly recommended. The problem of trying to determine whether or not any given physical disability affects the attitudes and behavior is more difficult than the facts of the disability. From the characteristics of children with various types of physical defects, cited in Part II of the present volume, it is evident that certain maladjustments are often present. It is a problem in diagnosis to determine from attitudes, emotions, and other adjustments whether or not any particular defect is having little or much effect in any particular case.

Personal habits and recreational factors. In this group there are thirteen factors including personal hygiene and clothing, looks, self-care, home duties, eating, sleeping, recreation, and playmates. It might be argued that many of these factors are themselves effects derived from still deeper causes, which is undoubtedly true. However, any particular factor, such as eating habits, has frequently become so extreme and aggravated that for practical purposes it has also become a major cause of maladjustment.

Personality and social factors. There are eleven factors in this group including social and personality types, anger, fear, excitement, pity, interests, initiative and ambition, intelligence, and general behavior. Some of these factors are probably instinctive behavior, others are allied to feelings and emotions arising from other basic inventories. For example, fear probably has some deep underlying causations which should be discovered and remedied, but there should undoubtedly be some positive therapy attempted on the fear itself as an unfavorable factor and as causing behavior maladjustment.

Parental and physical factors of the home. There are eighteen factors in this group including parents' intelligence, education, age, health, personality, occupation, economic status, home language, other adults and siblings, legal status, and broken home. The attitude which the parent may have about these factors is reflected directly into the attitudes of children and may develop into causes of maladjustment. The effects are probably unique to each child even within the same home, since some children show acceptable and others unacceptable behavior from the same environments.

Home atmosphere. There are eight factors including general home atmosphere, ideals, religious influences, family recreation, parents' social adjustment, discipline, and attitudes between parents and child. Usually there is more emphasis placed upon these factors than upon the physical aspects of the home.

School adjustment. School adjustment includes three factors: attendance, scholarship, and attitude toward the school. These factors are also based upon deeper causations, but eventually they become basic problems themselves as may be recognized by anyone who has tried to change attitudes or radically improve scholarship in a brief time when it has become very poor.

For more complete details on how to study and evaluate all of these items the reader is referred to the Baker and Traphagen text, but a few general considerations may be offered. It is not to be assumed that each item exists separately by itself and without reference to other items or to the total picture. In order to encourage study of possible relationships the correlations of each item to the total scale for 189 behavior cases, for 180 nonbehavior cases and for the combination of both groups are given in Table XIII of the Baker and Traphagen text. In the behavior group family recreation is most closely related to total score of all the items, with children's diseases having the least relationship of all which probably means that both well behaved and poorly behaved children have measles, mumps, and other ills in due time.

Another set of basic relationships has been derived and placed in Table XIV in which the five items most closely correlated with each of the sixty-six are shown. These tables were made from the data on 189 actual cases and show when any single cause exists the others that are most likely to exist as well. Some very interesting relationships have come to light. For example, disturbances of growth or size for age are related to disturbances in initiative and ambition and may be generated from endocrine conditions, or nutritional or other etiological factors which have also affected growth. It is interesting to note that disturbances in size have their second most important relationship to the child's attitude toward his home. If a boy is small for his age, he may be treated in a condescending manner beneath his years; or if too large for his age, too much is expected of him which sets up emotional tensions and generates poor attitudes. In these studies basic relationships have been brought to light. The worker should build a theory as to why these relationships exist. By working to correct one factor, relief for an allied factor is also likely to result.

Experienced workers in the field of mental hygiene find all these methods somewhat incidental to discovery of the main issues in a problem. No method, such as a case history, is supposed to be recorded by matter-of-fact questions. The problem may be introduced by the child or by the parent at whatever point of immediate interest is uppermost at the moment. In a recent book Rogers[1] wisely emphasizes such topics as the creation of a counseling relationship, releasing expression by the child and the achieving of insight.

Relationship to Motivation and Total Pattern of Personality

There are intimate relationships between all of these motivating factors and the total personality pattern as described in the preceding chapter. Any of these sixty-six factors, singly or in combination, may set up frustrations and blockings of the fundamental motivation of childhood or of adolescence. Poor vision may precipitate a crisis in the child's drive for self-assertion and create a conflict which results in some acts or rebellion and unacceptable behavior. Any unfavorable factor may offer frustrations to the basic drives and motivations. These frustrations generate the conflicts with consequences as described earlier. Likewise, the various causes set up distortions in the pattern of personality with compensating distortions in other parts of the total pattern. When this displacement occurs there often results an apparent discrepancy between causes and effects which are often confusing to parents and teachers but readily understandable by clinical workers. In offering these explanations of case-study methods, it is not assumed that readers will thereby become fully informed and trained in clinical work, but rather that they may understand some of the basic principles upon which such programs are built.

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[1] C. R. Rogers, *Counseling and Psychotherapy*, Houghton Mifflin Company, Boston, 1942, 450 pp.

Other Investigations

In a discussion of methods of diagnosis, treatment, and follow-up the work of Dr. William Healy and of the Gluecks are the most thorough and outstanding of all investigations in these fields to date. Their programs have been somewhat closely related. Healy's studies have covered many fruitful years, first in Chicago, and more recently in the Judge Baker Foundation in Boston. Some of his studies include *The Individual Delinquent*,[1] *Delinquents and Criminals, Their Making and Unmaking*,[2] *Reconstructing Behavior in Youth*,[3] *New Light on Delinquency and Its Treatment*.[4] Further discussion of some of his studies will be made in Chap. XXV on Remedial and Preventive Programs.

In the study on *New Light on Delinquency and Its Treatment* 105 pairs of cases were selected in which one member of a family was delinquent but the other was not, and with comparisons between them. It may be noted in this type of study that as far as possible the home and environmental factors were as identical as possible so that delinquencies would probably spring from other sources. As a matter of fact it was discovered that the delinquent children had very different reactions from the nondelinquent even toward their family backgrounds. Of the 105 delinquents, 9 were found not to have strong, emotional factors behind their maladjustments but the remaining 96 were characterized on the average with more than two such trends. These were distributed as follows: 46 cases had feelings of rejection, deprivation, insecurity, and lack of understanding; 28 cases felt thwarted; 46 had feelings of inadequacies or inferiorities in their home life; 34 had intense feelings of discomfort about family disharmonies; 31 were jealous; 17 had internal mental conflict; and 9 had a conscious or unconscious sense of guilt about earlier delinquencies.

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[1] W. Healy, *The Individual Delinquent*, Little, Brown & Company, Boston, 1915, 830 pp.

[2] W. Healy and A. Bronner, *Delinquents and Criminals, Their Making and Unmaking*, The Macmillan Company, New York, 1926, 317 pp.

[3] W. Healy, A. Bronner, E. Baylor, and J. P. Murphy, *Reconstructing Behavior in Youth*, Alfred A. Knopf, New York, 1929, 325 pp.

[4] W. Healy and A. Bronner, *New Light on Delinquency and Its Treatment*, Yale University Press, New Haven, 1936, 226 pp.

It is evident that emotional and personality factors played an important role in their delinquencies. Confirmation of this finding is found in Baker and Traphagen in which the personality and social characteristics of children were the most marked group of factors differentiating between behavior and nonbehavior cases.

The investigations by the Gluecks have resulted in several important reports including *Five Hundred Criminal Careers,*[1] *One Thousand Juvenile Delinquents,*[2] *Later Criminal Careers,*[3] and *Juvenile Delinquents Grown Up.*[4] *One Thousand Juvenile Delinquents* is an analysis of cases from the Judge Baker Foundation in Boston under Healy's direction. In this investigation six factors in predelinquency days were found to be most significantly related to probable delinquency out of a list of some sixty factors, and these were as follows: unsound discipline by father, by mother, school retardation of three years or more, school truancy or other misconduct, early age of first-known behavior disorder, and length of time between onset of delinquency and the examination of the child by the Judge

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[1] S. Glueck and E. Glueck, *Five Hundred Criminal Careers,* Albert A. Knopf, New York, 1930, 365 pp.

[2] S. Glueck and E. Glueck, *One Thousand Juvenile Delinquents,* Harvard University Press, Cambridge, 1939, 341 pp.

[3] S. Glueck and E. Glueck, *Later Criminal Careers,* The Commonwealth Fund, New York, 1937, 403 pp.

[4] S. Glueck and E. Glueck, *Juvenile Delinquents Grown Up,* The Commonwealth Fund, New York, 1940, 330 pp.

Baker Foundation. In the three other books there are reports on criminal cases with follow-up of records and prognostic tables based upon the earlier conditions.

In summary it should be stated that in methods of diagnosis much detail needs to be assembled efficiently and without too great expense. This material must be evaluated and remedial measures instituted as far as possible. The entire data must be coordinated into a comprehensive pattern for any individual since he is the sum-total of many factors and experiences. This condensed summary of various methods offers an introduction to sources. It is beyond the scope and purpose of this discussion to offer suggestions for training of workers since that field is a large one, in and of itself.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Relate any experience you may have had with a case diagnosed and treated by some clinic, and discuss with respect to success or failure.
2. Give examples of conflicting methods in educational methods and explain their implications. Cite parallel problems in methods of case work.
3. Make a study and report on various personality tests and what results are obtained by them.
4. Report on the case of Catherine cited in Watson's text with respect to positive and negative, destructive and constructive factors in the ego and libido.
5. Discuss Paul's case as cited by Rogers in illustrating his component-factor method.
6. Discuss the seven illustrative cases in Baker and Traphagen's text by the case-history method.
7. Make further reports on studies by Healy and Bronner, and by the Gluecks.

Chapter XXV

REMEDIAL AND PREVENTIVE MEASURES

One of the most important phases of remedial work is to discover what improvements can be brought about in specific causes if improvement is to take place in behavior. In many investigations behavior causes have apparently been assumed to be in a state of immobility, whereas it is more meaningful to consider them in a state of flux or change. Such an approach has been made under the author's direction and reported in a student's master's thesis.[1] The method will be described now and summarized since it promises to have important implications for remedial work.

The problem of improvability was motivated by the knowledge that some causes of maladjustment seemed to be more susceptible to improvement than others, but little was known about what items offered such possibilities. It is a matter of practical knowledge that some behavior cases have yielded favorably to treatment while others have made relatively little improvement. This phenomenon will be reviewed in the light of the present findings. In the study of specific causes two types of change are possible. One type occurs when the item itself is capable of improvement, such as the use of glasses to correct an eye condition that was a cause of behavior maladjustment. A second type of change does not involve change in the item itself but in the attitude with regard to it, for example, a satisfactory adjustment may be made to total blindness of an incurable type.

When any single case is studied only a few causative items come under observation, but in studying a group of cases a large number of items are affected, such as the sixty-six items in the Detroit Behavior Scale. As a result, information in many areas of causes becomes available. In the present investigation the status of all sixty-six causes in two hundred cases of poor behavior were compared for the same item in an equal number of well-adjusted cases. The study also involved the relationships that existed between each item and all of the others in the group of behavior cases as compared to corresponding relationships among the well-adjusted cases. From these relationships between items it was possible to contrast the relationship of each item to all other items in the behavior group as compared to such relationships in the control group. This constant shifting from one group to the other produces much the same effect as if the well-behaved children themselves shifted from their favorable status to an unfavorable one, or vice versa. In this shifting, the changes occurring in causes and in their relationships to all other items could be studied. Although these were not the same children in both groups, for practical purposes, they might be considered the same, since some individual children are known to shift from acceptable to unacceptable behavior. At this point the center of interest was shifted from children's behavior to the possibility of changes in the causes. The possibilities of change became a practical matter in trying to do remedial work on the behavior cases. It was discovered that some items were more pliable or susceptible to change than others.

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[1] A. W. Rodeheffer, "A Study of the Relationships in Behavior Factors," Master's thesis, Wayne University, Detroit, 1940, 100 pp.

The approach to the problem of change was centered around the relationship of each item to all of the other sixty-five items as shown partially in Table XIV, pages 362–366, of Baker and Traphagen's *The Diagnosis and Treatment of Behavior-Problem Children.* In that table the five highest items were listed for each item with respect to the five highest relationships to that item. In original unpublished tables the relationships of all items to each other were necessarily computed so as to find the highest five for each item. A total of 2145 simple correlations was computed in order to secure this information for the behavior group. Meanwhile some samplings of relationships between items for the control or nonbehavior group had shown that in some instances the relationships were quite different than for the behavior group. It was decided to complete these 2145 correlations also, so that comparisons of all corresponding relationships could be made between behavior and nonbehavior groups.

The next step consisted of arranging the items in order of their correlations from highest to lowest, such as is shown partially in Table XIV mentioned above. In one column were shown all of these items for the behavior group, and ranged beside it was the order of items for the nonbehavior group. For example, the order of relationship of all the other sixty-five items to Item No. 1 on Child's Early Health was arranged in a first column of a table. In a second column the order of relationship of items with respect to Child's Early Health for the nonbehavior group was presented. The same process was followed for all sixty-six items with the rank order of items listed for behavior and nonbehavior groups so that a series of sixty-six such tables were prepared.

The next step consisted of studying the two columns of each table, such as Child's Early Health and noting whether the order of relationships of items to Child's Early Health were in nearly the same or in different order for the behavior as for the nonbehavior group. An inspection of various tables showed that for some items the order of the relationships between behavior and nonbehavior items varied in a considerable degree, while others had a high correspondence of item order between the behavior and control groups. These facts were next thrown into a simple number form by determining the correlation between the order of items in the behavior and nonbehavior groups within each of the sixty-six sets of comparisons. In computing these correlations the Rank Order Method of correlation was used, although the number of items was somewhat larger than is usually recommended for it. A sampling of correlations made by the usual Pearson r method at various levels showed that the order or results was practically the same as by the Rank Order Method so the latter was used. It was now possible to compare the closeness of relationships of items between behavior and nonbehavior groups for each of the

TABLE XX

PLIABILITY OF THE SIXTY-SIX ITEMS OR CAUSES

Order of Greatest Pliability	*Main Classifications of Causes*					
	Home Atmosphere	*Personality and Social Factors*	*Physical Home Factors*	*Habits and Recreational Factors*	*School Factors*	*Health and Physical Factors*
1				19 conditions of eating		
2			48 occupation			
3			40 father's education			
4		34 interests or hobbies				
5	57 ideals of home					
6			49 economic status			
7			41 mother's education			
8				24 early recreation		
9				14 hygiene clothing		
10	59 family recreation					
11				22 sleeping conditions		
12		28 personality type				
13				18 home duties		
14			39 mother's intelligence			
15	60 parents' social adjustment					
16			46 father's personality			
17	62 attitude to child					
18		35 initiative and ambition				
19			50 home language			
20	61 discipline					
21				25 later recreation		
22						21 convulsions, seizures
23						7 visual defect
24		31 excitement, shock				
25		36 vocational interests				
26		27 social type				
27	63 child's attitude					
28						9 orthopedic defect
29		29 anger, rage				
30			38 father's intelligence			
31		37 general behavior				
32						5 accidents
33	58 religion					
34	56 general home atmosphere					
35					64 attendance	

TABLE XX (*Continued*)

Order of Greatest Pliability	*Main Classifications of Causes*					
	Home Atmosphere	*Personality and Social Factors*	*Physical Home Factors*	*Habits and Recreational Factors*	*School Factors*	*Health and Physical Factors*
36		30 fear, anxiety				
37			47 mother's personality			
38			45 mother's health			
39						2 present health
40				17 present self-care		
41					65 scholarship	
42						6 speech defect
43				26 playmates		1 early health
44						
45		32 pity, sympathy				
46				21 time of sleeping		
47						4 infectious diseases
48			44 father's health			
49					66 attitude	
50			55 broken home			
51				15 looks or appearance		
52				20 eating habits		
53			54 legal status			
54			42 father's age			
55				23 dreams		
56				16 early self-care		
57			51 other adults			
58						13 nervousness
59			43 mother's age			
60						8 hearing defect
61						11 motor coordination
62			52 sibling number and position			
63			53 sibling adjustment			
64						10 size
65						3 children's diseases
66		33 intelligence				
Group order of pliability	1	2	3	4	5	6
Group order of absolute differentiation	3	1	5	4	2	6

Explanation of Table XX. The order of greatest pliability is shown at the left and is read so as to apply horizontally across all six columns. The number beside each topic in the body of the table represents the numbering of that item in the Baker and Traphagen text.

sixty-six items. In other words, there was a certain order of relationship within the behavior group between Child's Early Health and all of the other sixty-five items of the scale which could be contrasted with the relationship between Child's Early Health and all other sixty-five items in the nonbehavior group.

When each of these sixty-six items or causes was studied in this manner some correlations were much higher than others. Whenever a correlation or correspondence of relationship was high between behavior and nonbehavior groups with respect to any key item such as Child's Early Health, it was evident that that key item itself must be susceptible to change, otherwise such a consistent relationship could not be maintained within both the behavior and control groups. This item was, therefore, concluded to be of a highly flexible or pliable nature since it retained the same general relationship to all other items, whether in behavior or in nonbehavior children. On the other hand, if a correlation was low between the key item and all of the others in shifting from behavior to nonbehavior groups, it was evident that that key item was sufficiently rigid to stand its own firm ground and hence all of the other items had to seek new orders of relationship to it. Such an item was judged to be relatively rigid or susceptible to little change.

In practical therapy the items which are pliable are most susceptible to change or improvement. The order of items with respect to their pliability is shown in Table XX and the table is subdivided further according to the six main classifications of the sixty-six items or causes.

Interpretation. The most pliable of all items with a rank of 1 is item 19, Conditions of Eating. This fact is interpreted to mean that when a group of cases has moved from nonbehavior to behavior problems, eating together as a family function has deteriorated for behavior children as a group although not necessarily for every individual. Since the item is pliable, parents may be advised that it is the most easily restored of all behavior causes or situations if they will make the effort. In other words, no matter how bad the eating conditions may have become, if all members of the family honestly resolve to declare a truce and be pleasant at mealtimes, the plan has a good chance of succeeding. This change may then spread to other areas and bring about a general improvement. It works in actual practice.

Table XX is worthy of much study from the standpoint of therapy. The items near the top of the table are relatively more susceptible to change than those near the bottom of the table. This pliability may consist of actual change in the item itself or it may consist of a better attitude toward the item if it is not susceptible to change.

The second and third items at first thought seem a little difficult to understand. However, it was noted during days of depression that loss of job or a change of job on the father's part, with attendant loss in effectiveness of his education, often upset the entire family's point of view as well as its economic status. In a converse manner, sudden prosperity in boom times is a disturbing influence to general home atmosphere.

It is interesting to note that the child's intelligence is the least pliable factor of all. This has been substantiated by evidence in practically all clinics where children have been examined. If a child is dull, his insight into all other phases of behavior tends to be on about the same level whether he is a behavior or a nonbehavior case. Among the least pliable factors is sibling attitudes which rank sixty-third. This position tends to be verified in many cases in which long and patient attempts to change jealousy patterns have been comparatively fruitless. Levy's intensive program on this topic will be noted later.

By following down any column of Table XX it may be noted in what order the items arrange themselves as to pliability within that classification. In the last column, on health and physical factors, vision defect is much more pliable than hearing defect, which is interpreted to mean that a child is more likely to wear glasses than a hearing aid. Attendance at school is more pliable than the child's attitude toward school. In other words, he can be forced by law to attend school, but the law cannot change his attitude.

At the bottom of Table XX are shown two sets of rank orders. The first represents the median order of pliability of each of the six classifications of factors with home atmosphere factors, as a group, being the most pliable. This result is very hopeful, since most readjustments of behavior children must be made in their own homes rather than in foster homes. A second encouraging fact is that the personality and social factors of the child are second in order of pliability. This knowledge is especially helpful since the actual differences between behavior and nonbehavior children are the greatest in this area. The health and physical factors are least pliable which might logically be expected.

At the bottom of Table XX is also shown the order of the classifications as to the amount of actual difference in scores on the five-point scale between behavior and nonbehavior cases. While there is some parallel between the rank order of actual difference and the rank order for pliability there are certain differences which are very important in therapy. The three school factors are second in order of differentiating between behavior and nonbehavior, indicating that the school maladjustments of the behavior cases are quite severe. In terms of pliability they are the next to the lowest, or fifth in order. In other words, school maladjustments are extreme in behavior cases and there is relatively less hope of restoration or change for the better. Many of these cases have had long-time school failures and poor attitudes which also makes for lack of pliability. The fact that physical disabilities are comparatively rigid strongly indicates the need for special classes and schools such as sight-saving and those for other physical handicaps.

Implications for therapy. The implications for therapy in terms of pliability and rigidity are very important. If a behavior case has several items or causes of a comparatively pliable nature, the chances of improvement are much greater than if his items are comparatively rigid. If the maladjusted items of a case are: the child's interest and hobbies, the ideals of the home, the occupation of the father, the conditions of eating, sleeping conditions and other items at the pliable end of the scale, the chances of readjustment are comparatively good; but if the items are: dull intelligence, sibling jealousy, a deviation in size for age, poor motor coordination, other adults in the home with unfavorable attitudes toward him, and similar items at the nonpliable end of the scale, the chances for successful change are much more meager.

There are certain other general techniques or procedures which are in common practice for the improvement of behavior, and a few of them will now be discussed.

Foster Home Placement

One of the most commonly recommended treatments is removal to a foster home. This plan seems to be a quick and easy way to solve behavior problems, since it immediately changes many of the unfavorable factors to favorable ones. There are certain difficulties in the way of such a program which make its widespread use impracticable.

One of the strongest objections to foster-home placement is the traditional belief that the child's own home is the best possible place for him. Natural forces generally beyond the control of any individual, and resting in social tradition, dictate that the child should remain in his natural environment. Conditions must be very bad before the parent willingly considers foster-home placement. A second difficulty is largely financial since most parents whose children need foster-home placement are the ones who cannot afford it. They look upon it as an additional expense; it is difficult to allocate food costs in a family unit to any particular individual and any expense for lodging is plainly additional since there are facilities at home. The expense must often be borne by some social agency, and comparatively few have more than a very limited budget for such purposes. Another solution to the financial difficulty may be used when the home conditions become so bad that courts order foster-home placement at public expense.

In spite of these difficulties there has been wide use of foster homes. The White House Conference [1] reported that in 1930 over 100,000 children were in foster homes under the general supervision of four hundred child-placing agencies. While many placements were on account of dependency, a large proportion were placed on account of behavior and delinquency. There are many types of conditions surrounding foster-home placement, including the child's problem, the type of the child's own home, the nature of the foster home, the presence of own children in the foster home, and the kind of supervision afforded by the child-placing agency.

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[1] White House Conference, *Dependent and Neglected Children,* D. Appleton-Century Company, Inc., New York, 1933, p. 26.

With all of these complicating conditions in mind it is encouraging to note that more than a majority of cases in foster homes show marked improvement. Rogers [1] summarizes several investigations and noted from 60 to 80 per cent improvement. Healy and Bronner [2] recently reported 87 per cent success on sixty-one such cases under their general supervision. They note that in twenty-two other cases with very abnormal personalities, foster-home placements or any other type of adjustments do not justify the time and money spent on them. As a general proposition foster-home placement is one of the hopeful means of rehabilitating children, but the expense involved is quite a barrier in the great majority of instances. The use of foster homes should not be considered a failure merely because some cases fail, since the fallacy of condemning any activity because of exceptional failure has been a much abused and overworked practice in other situations as well.

Special Schools and Institutions

Some of the more serious problem cases reach such an aggravated form that regular schools find it impossible to keep them in classes. A few large school systems have established special schools or classes for them with considerable success. At first thought it might seem that behavior conditions would become intensified if segregation was practiced, but instead there is usually a lessening of the malbehavior. In the special class or school remedial measures are concentrated, there is an emphasis upon health and nutritional conditions, and there are teachers of remedial reading, social workers, psychologists, and other adjustment workers. The special educational program is adapted to their needs with much emphasis upon physical activity as an effective antidote for emotional disturbances. Examples of such schools are the Montefiore School in Chicago and the Moore School in Detroit. After such schools have been in operation for several years, it is difficult for them to avoid a reputation of being a school for bad boys. Some parents become reluctant to enroll their children. In Cleveland, the Edison School eventually changed its emphasis to vocational and trade training with behavior maladjustment becoming a secondary issue.

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[1] C. R. Rogers, *The Clinical Treatment of the Problem Child*, Houghton Mifflin, Company, Boston, 1939, p. 80.

[2] W. Healy and A. F. Bronner, *Treatment and What Happened Afterward*, The Judge Baker Guidance Center, Boston, 1939, pp. 46–50.

A few of the more seriously maladjusted cases become so extreme that disposal is necessary through the juvenile court or placing agencies. Commitment to state schools is the usual avenue of relief. Most states have such schools and no matter by what names they are known their programs are faced with tremendous odds, since they represent the last of a series of sifting processes by schools, courts, and agencies.

Most of the special schools admit boys over twelve years of age whose behavior has become chronic and of long standing. Instead of the special school with segregation it would be much more desirable if these cases could be discovered and treated when they were much younger with preventive rather than remedial measures. Some obstacles to such programs are: the present adjustment staffs of school systems are so overloaded with older chronic cases that the preventive program is difficult to initiate; problems in younger children do not seem to be so significant and can be controlled by disciplinary measures, although youthful delinquencies are gradually being taken with more concern; a tradition that the main task of schools is to educate in the usual ways and not concern themselves with the home backgrounds and adjustments; no understandable or practical plan of cooperation between social agencies and schools in the treatment of cases. Too often agency workers do not appreciate fully the problems which a teacher must face in dealing with one or more maladjusted children and at the same time conduct the regular program of a full-sized class of children. There is a gradually widening conception of education which recognizes that adjustments in personality and social characteristics are as much a function of education as learning in traditional fields of subject matter.

It may always be necessary to have special provision for a small residual group whose total personality and behavior patterns are so chronic that usual procedures are not effective. The entire program of behavior adjustments should not be judged on the basis of this small residue of cases.

Parental Attitudes

In attempting any therapy the attitudes of parents are very important factors. These attitudes may vary from one extreme of great concern to one of complete indifference. With older children the therapy is sometimes conducted on them only, without reference to parents whose chances of change were rather poor. Rogers[1] lists four problems in parental attitudes: the motives for change, the parents' own adjustments, the parents' learning ability, and the qualifications of the therapist. Successful changes in parental attitudes probably follow the usual curve of frequency distribution, with about one-fourth with very little probability of change. There are many variables to be considered, including as yet undetermined combinations of the sixty-six factors and a large number of other circumstances. In their hearts, the great majority of parents desire that their children shall grow up to be successful citizens and a source of pride and, therefore, the problem of motivation should not be too difficult nor discouraging.

Types of Individual Therapies

There are many types of therapies for individual cases. Some are known by the names of their originators such as Freudian psychoanalysis, Adler's individual psychology. Practically every child-guidance clinic has special methods or points of emphasis characteristic of its particular program. Since there are very extensive sources for the study of various methods only a few of the high lights will be sketched.

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[1] C. R. Rogers, *op. cit.*, pp. 210–218.

Courtesy of Department of Education, University of Chicago

Visual screening test with the Ortho-Rater, Department of Education, University of Chicago.

Courtesy of *The Reading Clinic, Temple University*

Finding reading levels at The Reading Clinic, Department of Psychology, Temple University.

The Freudian method assumes that individuals have deep-seated conflicts which seldom or never rise to the level of consciousness, but are nevertheless strong motivations for behavior. The motive for race preservation through sexual behavior plays an important role, although many other submotivations are also recognized. The emphasis upon sexual backgrounds has tended to narrow the field of causations upon the part of its most literal Freudian followers. Currently, the literature of psychology and psychiatry is filled with debate and criticism about the general effectiveness of Freudian methods.

The release of emotional tensions is accomplished by Freudian methods and by various allied mechanisms. It is illustrated when a young child suddenly blurts out a confession about his home life in the quiet of a schoolroom and at a time quite foreign to the interests of the moment. In a period of play or informal companionship with a comparative stranger, children often release opinions and attitudes which would not come to light by direct questioning about these same topics. The play technique of therapy has become a popular means of bringing such ideas to light. Levy [1] has analyzed his experience in play therapy with dolls which represent different members of the family, and children are allowed to punish or destroy them as symbols of actual conflicts at home. These activities release the tensions at home toward these same individuals. Play should be a very helpful therapy since in the discussion of pliability of items noted earlier in the chapter, sibling jealousies were among the most rigid items.

The ego-libido method described by Watson [2] takes the dynamic view that factors may be classified according to destructive or constructive influence and also according to whether experiences are satisfying or unsatisfying within the destructive or constructive groups. In the main, it is her purpose to convert causations into satisfying and constructive categories.

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[1] D. Levy, "Hostility Patterns in Sibling Rivalry Experiments," *American Journal of Orthopsychiatry*, 1936, 6, pp. 193–257.

[2] M. Watson, *Children and Their Parents*, F. S. Crofts & Co., New York, 1932, 362 pp.

In many clinics the approach is made by case-history techniques which disclose general and specific causes such as are noted in the Baker and Traphagen list of sixty-six factors. Specific remedial measures are undertaken on as many of these causes as time and circumstances will permit. With greater knowledge of pliability of items, cases may be sifted more intelligently into classifications according to possibilities of therapy.

Some Therapeutic Materials

Many books and publications offer direct and indirect suggestions for therapy. A few which have been prepared by the author will be mentioned. In Baker and Traphagen's *The Diagnosis and Treatment of Behavior-Problem Children*[1] the sections on interpretation offer many specific suggestions about possibilities of treatment for each of the sixty-six factors. In a second book for parents and teachers by the author, *The Art of Understanding*,[2] further concrete interpretations are offered on the nature of conflicts and motivations and with concrete situations in which these principles apply. A four-page bulletin for parents has been prepared with brief paragraphs on thirty different topics entitled *Suggestions for Training Children*[3] and for local use mimeographed editions in Italian and Polish have been translated and prepared by staff members of the Detroit Psychological Clinic. These *Suggestions* afford an opportunity for parents to study at their leisure problems which may have been explained orally but which are hard to assimilate quickly since they are outside of their usual line of attention and thought.

In order to assist pupils of junior and senior high schools, a series of remedial suggestions have been prepared for each of the twenty-four areas in the Detroit Adjustment Inventory[4] noted in Chap. XXIV. In practical therapy these suggestions are given out as a supplement to personal interviews and wherever they have been used, pupils are very enthusiastic about them. Sometimes therapy in written form, as well as written diagnostic inventories, are accepted in a freer vein than when the personalities of the pupil and interviewer offer a complicating situation.

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[1] H. J. Baker and V. Traphagen, *The Diagnosis and Treatment of Behavior-Problem Children*, The Macmillan Company, New York, 1935, 393 pp.

[2] H. J. Baker, *The Art of Understanding*, The Christopher Publishing House, Boston, 1940, 400 pp.

[3] H. J. Baker, *Suggestions for Training Children*, Public School Publishing Company, Bloomington, Ill., 1940, 4 pp.

[4] H. J. Baker, *The Detroit Adjustment Inventory* (With Remedial Suggestions), Public School Publishing Company, Bloomington, Ill., 1941.

As a practical guide for schools the following suggestions have recently been prepared by the author.

1. Aim sincerely to understand him and his problems. Understanding removes the mystery of his behavior and helps you to believe in him. He will probably become aware of this attitude after a short time.
2. Arrange a sponsor for him—principal, assistant principal, or some teacher. Let him choose this person, preferably not his own teacher. Have him report informally about once a week with any note which others may care to send. This plan should not be called probation and no particular pattern is recommended for it; leave it to the ingenuity of pupil and sponsor.
3. Find out his chief grievance, gradually substitute other activities for it without necessarily leading him to believe you are catering to him. An imagined grievance does about as much harm as an actual one.
4. Find some thing or things which he can do well and for which he will get favorable recognition from his classmates. He probably has some interests, either within or out of school which may be capitalized. At first this recognition will tend to "go to his head" since he is not used to it, but he will gradually tone down and accept it in the same way as other pupils ordinarily do.
5. Gradually enlist the cooperation of a small group of classmates in his progress, by tactfully pointing out how well he is doing and how hard he is trying. A little praise from classmates sometimes does much more than the effect from any adult because it comes at their own level.
6. Enlist the parents to believe in him, have them find ways in which he may be praised at home for effort and good behavior. Suggest activities to them for out-of-school projects: scouts, hobbies, music, etc. A busy, interesting program is the best antidote for idleness and mischief.
7. Have his physical defects corrected, including minor ones which may be affecting his progress. Extend this plan to traits of character and personality as far as possible.

8. Arrange a flexible program in school. Let him realize this is a sympathetic attempt to get him up to a better level. Eventually he should strive to restore to the usual program. Frequently a brief rest period is the best antidote for uneasiness and disturbing behavior.
9. Do not be too much discouraged and do not let him become discouraged by some lapses. Keep up his confidence and share yours with him. The lapses will become less frequent and severe. Help him to realize that these concessions are not coddling, but opportunities for him to make good which is his responsibility.
10. If this program does not work successfully after a fair and thorough trial, you are probably dealing with a serious case which should be referred again for clinical diagnosis.

A General Guide

On account of a multitude of motivations, situations, and conflicts, children become frustrated in their activities. They crave attention and favorable recognition for successful performance both at home and at school. If they do not succeed in such directions, they are impelled to create disturbance so that they gain attention although that attention may be of a disagreeable nature. On the positive side, if the child's interests may be discovered and cultivated at an early age with appropriate praise and a feeling of success, a large amount of what is now considered malbehavior will disappear.

Results of Treatment

It has sometimes been assumed that long and intensive treatment must be practiced if effective results are to be obtained. This general statement needs qualification depending upon the type of case, the nature of causes, and what therapeutic measures and suggestions are available. Cases range from those in which one simple, obvious cause is quickly removed by one interview to those with many complicating factors and unfavorable outcomes after many treatment interviews.

Healy and Bronner[1] report on the number of psychiatric interviews and successes on four hundred cases after a period of years with results as per the following Table XXI.

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[1] W. Healy and A. F. Bronner, *Treatment and What Happened Afterward*, The Judge Baker Guidance Center, Boston, 1939, 54 pp.

TABLE XXI

RESULTS IN TERMS OF INTERVIEWS

Interviews	*Cases*	*Favorable*	*Unfavorable*
1 or 2	111	99	12
3 to 10	210	164	46
10 to 25	62	44	18
25 to 50	10	9	1
50 to 100	7	7	0
Totals........	400	323	77

It will be noted that approximately 90 per cent of those who had only one or two interviews made favorable adjustments, whereas 18 out of 62 cases with from 10 to 25 interviews had unfavorable outcomes. As a group the entire 400 cases represent serious problems, with 207 having problems of personality and behavior, 137 as noncourt delinquents, and 56 court delinquents. It will be noted from the table that in 81 per cent of the cases there were favorable careers and only 19 per cent unfavorable.

Although unacceptable behavior may seem to be shrouded in mystery in the popular mind, scientific methods of diagnosis and treatment have been able to meet that challenge. It now remains the problem to disseminate this information and make it effective in the home, the school, and in the lives of children, so that eventually malbehavior and crime will be reduced to a minimum.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Discuss some case in which treatment was successful, and one unsuccessful with probable reasons.
2. Report more fully on studies of foster-home placement.
3. Report on cases treated by the ego-libido method as described by Watson.

4. Report on the methods of Freudian analysis, upon Adler's methods.
5. Make a more comprehensive list of therapeutic materials than is listed in the text.
6. Report more fully on Healy and Bronner's *Treatment and What Happened Afterward.*

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Chapter XXVI

MISCELLANEOUS SOCIAL CONDITIONS

In the preceding chapter many specific causes of unacceptable behavior were presented. In this chapter some of the more general social, economic, and political problems will be discussed with special reference to behavior and emotional adjustment. They include bilingual children, indigent families, homes with parents mentally ill or in prisons, and multiple-birth children.

Bilingual Children

As the term implies, there are children who hear or speak two languages at home. In the early days of American life, English was the chief language used in America with the exception of a little French and Dutch. In the past hundred years there has been a large immigration, first from northern Europe and more recently from southern Europe, involving languages other than English. Aside from the inconvenience of a second language many other problems have accompanied these immigrants to our shores. While America has openly welcomed the newcomers there have been many complicating attendant problems. In 1930, 28 per cent of all the American population was foreign born. In some large cities it runs well over 50 per cent.

The problem of language. At first thought it might be concluded that learning two languages is no problem and that children are at a great advantage in knowing more than one language. There is confusion for young children in learning two languages particularly if both languages are spoken to them by the same individuals such as parents and siblings. Better results are obtained when different individuals speak a particular language to a child, so that he associates one language with one individual, according to Smith.[1] In some respects learning one language is a difficult task for a young child and therefore two languages at an early age is a double burden. Some words of any two languages are very similar, but others are very different. In most all languages the idioms and sentence structure are unique to that particular language so that the general pattern of thought formulation must be different. The practice of generally delaying the study of foreign languages until the high school or college is mute evidence of the implied difficulty of mastering two languages.

Intelligence and bilingualism. Many studies of the intelligence of different nationalities represented in American schools show median scores below the average American standard. When these scores are equated with native-born children of the same socioeconomic status the differences disappear, even in the case of verbal material, according to findings by Pintner and Arsenian.[2] Other investigators have obtained similar results. There is much less difference between results, either with verbal or nonverbal test material than has been assumed from earlier investigations. The real difference does not lie in the language but in the lower social and economic status of the majority of immigrants with a non-English language background.

There is a second confusing element in that individuals with dull or defective intelligence have much greater difficulty with bilingual situations than do children of average or superior intelligence. Whenever a child shows considerable confusion and slowness in English, and has heard a second language spoken in his home from early childhood, there is strong tendency to account for his English backwardness by bilingualism. It is a fact, likely to be overlooked, that one of his brothers or sisters who has lived in the same bilingual home speaks English fluently as well as the second language. Obviously the real difference must lie in the native brightness since the language experiences were the same. If hearing a second language were a universal handicap, bright children as well as the slow-learning would have equal difficulty, which is not the case. Whenever a child continues to be backward in English after several years experience at home, in school, or at play, it is quite certain that mental slowness of some degree is the real difficulty.

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[1] M. E. Smith, "Some Light on the Problems of Bilingualism as Found from a Study of the Progress in Mastery of English among Pre-School Children of Non-American Ancestry in Hawaii," *Genetic Psychology Monographs*, 1939, 21, pp. 121–184.

[2] R. Pintner and S. Arsenian, "The Relation of Bilingualism to Verbal Intelligence and School Adjustment," *Journal of Educational Research*, 1937, 31, pp. 255–263.

Social customs. In addition to language difficulty there are more serious problems arising out of different social customs. The American way of life is different. Parents in their homesickness cling to their early customs and language. They expect their children to continue with them as well, but their children are in closer touch with American ways and wish to adopt them fully. They resist their parents and sometimes become ashamed of them. Fathers take an unusually harsh and dominating attitude in matters of discipline, similar to that of their own early childhood but out of line with current American methods. Children try to escape from these restrictions by joining gangs whose similar feelings create close bonds. There is developed a vicious circle of causes and effects, leading to delinquency. In the larger cities the delinquency centers are located in the midst of immigrant groups, the second generation being the most fruitful source of trouble. In his studies of delinquency, Shaw [1] showed that the rates of delinquency remain practically unchanged in certain areas although one immigrant language group after another lives in them.

Unless very definite measures are taken upon a comprehensive scale the behavior difficulties of these groups run true to form regardless of the particular foreign language spoken in the home. There needs to be a better assimilation by parents of the customs of their adopted land and greater tolerance on their part for their children who are trying to fit into the American pattern. The parents themselves become very discouraged since they do not achieve all of the glorious results which some of their more successful peers have been able to do in this land of opportunity. America has paid a high price in delinquency and crime for many of its more recent immigrants. Some of this price could have been lowered if the true nature of the pattern had been known and community efforts had been made to meet it. The schools should assume their share of this program and interpret problems to the parents in such neighborhoods.

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[1] C. R. Shaw, *Delinquency Areas*, University of Chicago Press, Chicago, 1929, 214 pp.

Problems of Indigency

Children from indigent families create problems for the schools, a few of which will be discussed briefly.

Schools are democratic agencies and must attempt to treat all children as nearly alike as possible. Many critical problems are encountered. In neighborhoods where there are mixtures of indigent and well-to-do families, the children themselves often draw sharp lines which are very difficult for the teaching staffs to minimize. In preparing for pageants and special occasions, care must be taken not to make demands for costumes or other materials which cannot be met by a limited family budget.

Children often feel particularly apologetic about their clothes and develop feelings of inferiority which carry over into their general attitude toward school. They give false reasons for not wishing to do some particular task because the class will focus its attention upon them. Some school systems in large metropolitan areas require uniform clothes for all children within each of the two sex groups so that financial differences are better concealed.

With the more universal use of free or partially free lunches for indigent children various plans are in operation by which their special credit cards are not too obvious. Schools may also find ways in which indigent children may receive special praise and recognition for achievements in their chosen fields which is an excellent device in good mental hygiene. Any school which has many of these problems may do well to have an administrative and teacher committee on strategy to plan ways and means of meeting the problems which constantly arise in indigency.

There is need for close cooperation and understanding between the schools and the relief or welfare agencies in the interests of indigent children. A small percentage of indigent families disclose entirely different attitudes toward the schools than to the relief agencies. To the former they may show a type of rebellion about their condition and vent their feelings upon the schools with supercritical attitudes, whereas to the latter they present a most favorable picture of their children's success in school, and cordial cooperation with the teachers. A comparison of these divergent attitudes and a more comprehensive plan of cooperation is very helpful since children are easily disturbed by such discrepancies.

The problem of finances is a relative matter at all levels and is not confined to indigency. Children at all economic levels reflect minor differences. Among the well-to-do, merciless comparisons are often made between the qualities of fur coats which children wear to school or whether a chauffeur calls for the child in the family limousine. Children tend to make comparisons about the most trivial things, such as the quality of their lead pencils, with a view to building up their own personal vanity on the discomfort and embarrassment of their associates. Problems at the level of indigency are not particularly different than at other levels so far as social and psychological effects are concerned. They are worse only in absolute degree.

In teaching regular-grade children, there is a vast difference in the general attitudes toward the school between the higher and the lower economic levels. At first thought one might prefer to teach in a well-to-do neighborhood where the families and the general cultural status are above the general community standard. Experience has shown that in such areas the schools find it difficult to compete with homes of children in culture and information. No matter how proud a school may be of its encyclopedia some children explain with a disdainful air how much more elaborate and costly is the one at home. In like manner, any report of the teacher's summer vacation trip to a far-away land is more than matched by several pupils both as to distance and elegance of travel. It is difficult for the school to assume any position of leadership in communities of this kind, and teachers are continually challenged with comparisons unfavorable to themselves.

By contrast, the school in a neighborhood of poor economic and social status is the chief source of culture and inspiration, supplemented by the activities of the churches. There are very few other community agencies, no one travels far, there are very few books or magazines in the home, and the school is the highest standard known. The school library is patronized, the school building becomes a community center for evening meetings of adults, and the school principal is constantly consulted by parents about community problems not directly concerned with children. Although the children may be more backward socially and mentally, as a group, than those in the schools in the better economic areas, teaching staffs often derive more satisfaction from their work. Whereas the schools of a large system may be standardized as to construction and equipment of buildings and the training and personnel of administration and teachers, they serve entirely different functions depending upon the type of community in which they are located.

Indigency is not a problem distinct from other levels of economics but is only one step in the ladder. There are problems of equal importance throughout the entire scale of financial conditions. The conditions are somewhat more exaggerated at the lowest economic levels since there is no lower group upon which to compensate for inadequacies. By bringing out the best abilities and by giving recognition to good individual performance, the economic obstacles may be largely overcome.

Other Social Conditions

In Chap. XX there was a discussion of the number of individuals ill with mental diseases with an estimated 5 per cent either actively ill or at some time or other likely to be. Many of these unfortunate people have children in school, with their condition sometimes unknown to teachers. Needless to say there is much confusion and emotional unrest in their homes which is not conducive to quiet study and application to school tasks. Some of these children serve as guards for the safety of such parents until late evenings, on week ends, and when other members of the family must be absent at work. The strain and responsibility as well as actual physical danger in certain cases place a burden upon immature children far out of proportion to what they should logically be expected to stand. The irrational demands made upon them are most disconcerting including extreme obedience, absolute quiet, and sudden changes in mood which are quite outside of the realm of reasonable expectation. These conditions usually come on gradually so that the extreme gravity of the problem is not recognized even by other adults in the family.

If the parent is eventually sent to a mental hospital there may be relief from that immediate problem, but the responsibilities of the household may continue to fall more completely upon the children. Furthermore, they sometimes become alarmed over the possibilities of an hereditary condition coming upon themselves. They also feel the stigma of neighborhood knowledge about the condition which has developed in their home. Sometimes mentally ill parents have made extreme unreasonable demands upon the school, thus further embarrassing their children. In other instances the children share a wild delight in the orgy of threats of violence uttered at home against the school. Any schools or pupils that have escaped such experiences may indeed be considered fortunate. The small army of children who live in such conditions need a type of service for themselves and for their parents which the schools are usually unable to provide. Often there is little provision through other community sources.

If a community is able to develop a comprehensive social point of view, misunderstanding and lack of information about home conditions between the home and the school should be reduced. Otherwise, children are the victims of predicaments such as have just been described. Their schoolwork is always certain to suffer and with it the chances of successful preparation for an occupation worthy of their abilities.

Another group of children have one or both parents serving sentences in prison. About three hundred thousand new adults are sent each year. Many are parents of children in school, and in a ten-year period this amounts to three million individuals. Sometimes the schools are not aware of it, but neighbors usually are, and gossip eventually brings it to school in a distorted form. The child himself often knows all the details and has been forced to become a silent partner in the offenses. Whenever such children have previously held very high ideals about their parents, such an experience has lasting effects. Occasionally children are asked in school to give as a project oral or written reports about their homes and parents. Ordinarily it is motivated by interesting, intimate details, but in such cases it becomes very embarrassing.

A situation which offers special consequences for children is when both parents work and the children are left to look out for themselves. When the mother is at home she is very busy with her double duties and has little time for children. In case one parent is dead and the other parent works full time, the situation is much the same. Many such children become very lonesome and hungry for affection. In school they cling to their teachers and crave personal attention which it is not very practical for the school to give, except in incidental ways.

To all of these irregular conditions—bilingual children, indigent children, differences in general culture, parents who are mentally ill, parents in prison, parents who work all the time—may be added the various other types of conditions which are listed and described among the sixty-six factors in the Detroit Behavior Scale by Baker and Traphagen. In many respects these children are fully as handicapped as those with vision defects who are placed in sight-saving classes, yet their handicaps are not so obvious and seldom is there much understanding or special provision made for them.

It is not the purpose of this chapter to paint a dark and discouraging picture about the army of children who suffer from these general social conditions. However, if the schools are to reach their maximum efficiency and to realize the general goals and aims of education, there must be cooperation and understanding between the school and community in the improvement of conditions for children.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Describe any experience which you may have had with a case of bilingualism and interpret it.
2. Consult various sources of statistical data as to the number of people from the various nationality groups in America.
3. Illustrate some comparisons which children make with each other at many different economic levels.
4. Consult prison statistics and those of mental hospitals for the numbers and ages of their clients' children.
5. Visit some home or neighborhood where any of these conditions are frequent and gain firsthand information about the effects upon children, without creating unfavorable impressions by your visit.

Multiple-birth Children

Plural or "multiple-birth" children is a term applied to all births of more than one child at a time. They include twins, triplets, quadruplets, quintuplets, and any theoretically higher number. Any multiple-birth group attracts attention and great interest has been focused on it since 1934 with the birth of the Dionne quintuplets at Callendar, Ontario. Several full-length moving pictures of them have been very popular, while a nation-wide series of radio talks by their physician, the late Dr. Dafoe, as well as numerous articles in popular and scientific magazines attest to the interest which was aroused. Since there are over a million multiple-birth people in this country, their problems are worthy of discussion.

A few facts about the number of multiple births are of interest. One birth in every eighty-eight is twins, which would be 1.1 per cent of the births. Since two children in every eighty-nine are twins they constitute 2.2 per cent of all births. The birth ratio for triplets is one to the square of eighty-eight, or one in every 7744 births. By the same logic of ratios, quadruplets occur once in about every seven hundred thousand births, and quintuplets once in every five billion which makes this last group a very rare occurrence. Just why these ratios should occur is a puzzle to everyone, including those who discovered that they exist.

In multiple births there are two types of prenatal development, one called identical in which all members develop from one egg or ovum, the other fraternal in which each has a separate egg or ovum. In one set of quadruplets reported by Newman [1] two of the four were identical, but each of the other two were separate, or a total of three eggs. The Dionnes are all identical. One-fourth of all twin births are identical and the remainder fraternal, which would indicate that fraternal births among twins is a dominant hereditary trait and identical is recessive. Identical twins are much more alike than fraternal, and both are always of the same sex. Heredity plays a very important part in determining the probability of twins. The term "Siamese" twins arose from a famous pair of twins born in Siam in 1811, known as Chang and Eng, who were identical twins joined together in portions of their bodies until their death at the age of sixty-three years. A few other pairs of Siamese twins are in existence, although not all born in Siam. Before the days of modern research on twins, Galton shrewdly guessed that twins were of the fraternal and identical types.

Characteristics. It is not necessary to enlarge upon the generally accepted practices in the care and training of twins. As a group they are usually the objects of more indulgence than single-birth children. They become the center of greater interest and hence may be more likely to become spoiled. Since they are often mistaken for each other, they have to resist more temptation to masquerade as the other member, although such deception may be of a trivial nature.

The chief psychological problem centers around the basic question as to whether multiple-birth children should be encouraged to merge their activities, interests, and emotional lives into one closely knit unit or whether they should be encouraged to adopt a more individualistic point of view similar to those of single-birth children. There is a strong tendency for many parents to encourage the former point of view by dressing them alike, expecting them to do the same things at the same time and generally to live a communal rather than an individual life. Each member of multiple-birth groups is not encouraged to act or think without reference to the other. If one member falls into a mudhole and soils his clothes, which is an individual matter, the other must also change his clothes, too, which is a communal matter. A few parents practice these uniformities on children of different ages, making them the equivalent of a multiple-birth group. In all such cases the issue should revolve about the best adjustments of children rather than the fancies and personal desires of parents.

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[1] H. H. Newman, "Aspects of Twin Research," *The Scientific Monthly*, 1941, 52, pp. 99–112.

In early childhood attempts at communal uniformity are not so serious as in adolescence or as in adulthood when each individual naturally becomes much more individualistic about many important decisions. One pair of rather successful twin brothers recently stated that it was still difficult at the age of twenty years to make an individual decision without each first consulting the other.

There is some evidence that twins tend to lead very self-sufficient lives as a sort of subfamily unit by themselves. Therefore, they feel much less need for parental guidance or for the company of other children. They are likely to develop ideas and attitudes of an immature and childish nature similar to what would probably happen if children were allowed to grow up without any parental or other associates. This same phenomenon of a subfamily within a family is likely to occur when two children are nearly of the same age, or it may even happen less commonly when they are of quite different ages but with similar interests and psychological constitutions.

The other siblings of twins often live a somewhat unusual life because of extreme jealousy about the attention which their twin siblings receive at home and elsewhere. These feelings and practices are likely to be much more intense than in the case of one favored child in the family. In focusing attention upon the twins, parents are likely to be less aware than usual of the problems of their other children.

Identical twins tend to be very much alike in most respects and some who have been separated from infancy have been rejoined by the chance meeting with some person who knew one and recognized the other. Fraternal twins have no particular biological reasons for being any more similar than other members of the same family, except that they are born at the same time, pass through babyhood together, and have other associations of a very coincidental nature on account of like ages. There is a larger percentage of left-handedness among one of a pair of twins than among the remainder of the population with approximately 15 per cent as compared to 6 per cent for the total population. It is not known whether this phenomenon is due to heredity, or whether it comes from the position which one of them must assume *in utero* during the prenatal period.

Howard[1] gathered data by means of questionnaires and other methods for 229 sets of triplets. A sampling of preschool and school-age triplets on tests of general ability, language, and nonlanguage, showed them to be somewhat inferior to average single children of their age, but with the school-age group being nearer to the average standard. In tests of masculinity and femininity, they had interests and attitudes normal for their sex. Allowance was made for rural areas and lower socio-economic levels.

Studies of heredity and environment. One of the most fundamental problems of education is the improvement of the human race either through heredity or environment or both. It is as yet largely an open question what phases of human nature are susceptible to change through either heredity or environment and how these may be brought about if such changes are believed desirable. The study of twins offers one of the most profitable avenues for the study of these problems.

There are several combinations which it is possible to study for these influences. Whenever identical twins are brought up together and fraternal twins are likewise treated, it is possible to study the influence of the greater hereditary resemblance of the identical group over the fraternal group. This is also true of the environmental influences. Freeman[1] studied nineteen sets of identical twins, reared apart, and contrasted with them identical twins raised together, as well as with fraternal twins. He found one extreme case in which there was a difference of twenty-four points in I.Q. in favor of the girl brought up in the more favorable environment which is a very hopeful sign for the environmentalists. However, he does not report about the intelligence of these two girls at birth. There is a strong possibility of cerebral anoxia at birth upon the part of the one placed in the less favorable environment. He notes that due to the environment there seem to be greater differences in personality development than in intelligence or in physical factors. These findings correspond to the writer's results that personality factors are among the most pliable in a background as noted in Chap. XXV.

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[1] R. W. Howard, "Intellectual and Personality Traits of a Group of Triplets," *Journal of Psychology*, 1946, **21**, pp. 25–36.

Freeman's investigations were conducted very carefully and in the light of all factors that were available. It should be possible to coordinate studies of this type with the program of child-placing agencies so that by comparing siblings, fraternal twins, and identical twins of matched abilities in different environments, further information would be gained on this most vital problem of human interest. It is not the purpose to remove the glamour which goes with multiple births, but the welfare of children rather than the entertainment of parents should always be the guiding principle.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Make a more complete report on the Dionne quintuplets.
2. Cite your own observations about the behavior and development of a pair of twins with which you are familiar.
3. Make a further report on the heredity of multiple births.

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[1] F. N. Freeman, "Heredity and Environment in the Light of the Study of Twins," *The Scientific Monthly*, 1937, **44**, pp. 13–19.

CHAPTERS XXII–XXVI

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B. ORGANIZATIONS

1. The National Committee for Mental Hygiene, New York
2. National Probation Association, New York
   (See also Psychiatric Associations in preceding section)

C. PERIODICALS

1. *Mental Hygiene* (quarterly) by the National Committee for Mental Hygiene
2. *National Probation* (five times per year) by the National Probation Association

Part VI

Educational Retardation

Chapter XXVII

THE EDUCATIONALLY RETARDED

Many types of exceptional children have been presented and discussed in the earlier chapters of this book. One important group remains to be considered, that of the educationally retarded. In most books on exceptional children this group is either omitted entirely or given incidental mention in connection with other types of handicaps. In the minds of teachers, both of regular grades and special classes, as well as school administrators, the educationally retarded is one of the most important groups. The problem is worthy of study from many points of view but chiefly from the standpoint of educational rehabilitation and restoration.

Definitions

At some time in her experience practically every teacher has had enrolled in her classes one or more children who offer problems of special disability in reading, spelling, arithmetic, or other school subjects. These children are backward in one or more of their school subjects but appear to be normal mentally. Their failure is particularly puzzling to parents who recognize them as normal in all other respects. These children are the educationally retarded.

In looking for definitions the writer was impressed with the scarcity of ideas as presented by various investigators. In the main, the educationally retarded include those whose educational progress is not up to expectation after most of the usual causes of school retardation have been explored and allowances made for them. In listing the various types of the handicapped there has been frequent reference to retardation as related to such handicaps. For example, the totally deaf, particularly the congenitally deaf, as a group are retarded in educational progress because of deafness and by the severe limitations which it imposes on the usual avenues of learning. The mentally retarded have educational retardation due to retarded mental development. This retardation is with respect to chronological age, although with respect to mental maturity they usually work up to their mental age when given the advantages of special classes suited to their abilities. From a popular point of view there is retardation when a child does not work up to the level corresponding to his chronological age. After all of these obvious causes of retardation have been taken into account, one at a time, there still remains a group of the educationally retarded who merit further study and consideration.

Educational retardation takes two forms with respect to the grade placement of children. In the earlier days of universal education, previous to the modern mental-hygiene era, educational retardation resulted in the failure to progress from grade to grade according to chronological age. It was often easy to explain such failure to parents in terms of lack of interest, lack of effort, and many other alibis which placed the responsibility upon the pupil himself. The more recent practice is to promote practically all children by their chronological age without too much regard for their ability to do the work of the grade which they are entering. This plan is based on the philosophy that, regardless of educational retardation, the child is better off emotionally with children of his own size and age. In this situation the emotional effects of being frustrated by schoolwork beyond his level seem to have been disregarded. It is probably meant that "other things being equal" the child is better off with children of his own age, but unfortunately this is not always the case. Remedial instruction helps to solve this problem.

In terms of quantitative retardation, no definite standards have been set up for a definition of educational retardation. Generally one year of retardation in young children is as serious as two years in later elementary grades. When a survey is made of educationally retarded children, there are many who fall beyond such limits and upon whom the remedial program should be concentrated.

Concrete definitions of educational retardation may be expressed in many different ways. One method is by teacher's marks or school records. Some of these may be in terms of a per cent, popularly below 70. Schools that use ratings of good, fair, or poor would probably include the poor; others have a fivefold system of letters or numbers from A to E or from 1 to 5 with E's and 5's being the poorest. Detroit uses E's to denote excellent, with S as satisfactory, and U as unsatisfactory. Some school systems use no system of ratings at all and report to the parents by a general letter of explanation which might easily cover up such problems as educational retardation altogether. Another method of definition is in terms of retardation by standardized tests of educational achievement. For example, a reading age of eight years in a ten-year-old pupil would indicate a reading retardation of two years if all other obvious factors had been taken into account.

Characteristics of the Educationally Retarded

On the surface educationally retarded children do not show evidences of physical, mental, or most other handicaps. They do not grope about with extremely poor vision, they do not speak with a speech defect, they seem mentally alert, and generally they are fit specimens of normalcy. Parents are particularly disturbed about their lack of progress since there appears to be no obvious reason for their educational backwardness, whereas the hard-of-hearing child has allowances made for his school difficulties. There is more likely to be criticism of the schools for failure to bring about good educational results in the educationally retarded than in any other group of the handicapped, and hence in terms of good public relationships it is sound policy to make adequate provision for them. A more detailed examination soon discloses their characteristics and the causes of their difficulties.

Personality and social characteristics. Whenever any investigations are made of the educationally retarded, personality and social characteristics immediately come to light.

At the outset it should be stated that it is not known whether the educational retardation is caused by these characteristics, or whether these characteristics help to cause the educational retardation. In any event they tend to exist side by side, and which is cause and which is effect are less important than the need for a remedial program.

In a study of sixty cases of educational disability by the author,[1] five cases had excellent personalities, three superior

TABLE XXII

PERSONALITY AND OTHER FACTORS IN EDUCATIONAL RETARDATION

Type	*Number*	*Total*
I. Physical		
Slow-moving	7	
Undersized	6	
Oversized	4	
Lefthanded and speech defect	5	
Babyish, immature	3	25
II. Lack of aggressiveness		
Timid	6	
Dreamers	5	
Generally inadequate	5	
Lazy	2	
Weak voice	2	
Overcautious	1	21
III. Too aggressive		
Domineering	4	
Too quick	3	
Verbalist	2	
Overconfident	2	
Impulsive	2	
Happy-go-lucky	1	14
IV. Miscellaneous		
Foreign language	3	
Colored or mulatto	3	
Surly	2	
Coarse	1	
Spoiled	1	10
	Total	70

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[1] H. J. Baker, "Educational Disability and Case Studies in Remedial Teaching," Public School Publishing Company, Bloomington, Ill., 1929, pp. 19–30.

nineteen average, twenty poor, and thirteen very poor. It will be noted that more than one-half had either poor or very poor personalities in the opinion of the special coaching teachers who came to know them quite intimately. A further breakdown of the personality and other factors shows results as per Table XXII.

There was an average of nearly one and one-half characteristics per child, and only seven of the sixty cases had no such characteristics reported. Although the children in this study were selected upon the basis of school records, with failure in one or more of the elementary-school subjects and were not seen clinically before being selected, the coaching teachers felt that their problem was fully as much a matter of mental hygiene as of educational coaching.

Parental attitudes and home status. In the course of the experiment the homes of these children were contacted and in only fourteen were the attitudes cooperative, or less than one-fourth of the total. Fourteen home attitudes were rather neutral, twenty-one were uncooperative, and eleven represented miscellaneous neutral or negative circumstances which were difficult to classify except that they were not actively cooperative. In regard to home status only fifteen, or one-fourth, were poor or very poor, and about one-third were superior or very superior. Whenever homes of superior status and influence are neutral or uncooperative toward the schools on account of educational retardation, or for any other cause, it is a serious matter for public education.

In a similar study by Gates [1] there were also about one and one-half maladjustments per case reported on cases of reading disability, including thirty-five cases of extreme self-consciousness, thirty-three who became submissive, twenty-six had withdrawing reactions, eighteen made counterattacks of an antisocial nature, fourteen were truants or withdrew into gangs and truancy, sixteen put up a bold front, and ten were under nervous tensions. Such lists should show clearly the need for a program of educational rehabilitation.

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[1] A. I. Gates, "Failure in Reading and Social Adjustment," *Journal National Education Association*, 1936, 27, p. 205.

Other characteristics. In the Detroit experiment the median I.Q. for the sixty cases was 92 or within the limits of normal intelligence; the range of I.Q.'s was from 72 to 124. It is evident that the educational retardation could not be explained primarily in terms of mental retardation. There were thirty-nine boys and twenty-one girls or in about the ratio of two to one.

The number of cases. The number of cases is a problem involving many issues. It is intimately connected with policies of promoting children from grade to grade. A tremendous rate of failure has been noted in some school systems, ranging up to one-third or more of the pupils even in the lower elementary grades. Obviously, not all of these failures should be considered severe enough to have special coaching, but at least some of the more extreme cases merit such attention. There has been some reduction in the policy of failing children, partly by adapting curriculum standards to slow-learning pupils and partly by setting standards which they may be expected to reach with their more limited mental powers. Many school systems have tried to regulate the number of failures to between 5 and 10 per cent of the total. If a conservative point of view is taken so as not to include about one-half of the failures, the number in need of educational coaching should probably run from 3 to 5 per cent of all children.

In the Detroit experiment of 1925 cited above, all children nine years of age chronologically were studied in seven typical schools; and out of 894 such pupils 60 were selected for coaching or approximately 7 per cent of the total. These cases had either a conditional final mark of "4" or a failing mark of "5" in one or more of the four fundamental subjects. In an ideal situation every child should receive whatever special educational opportunities are necessary so that he may work up to his potentialities. The number should be kept at a conservative estimate until more facts are available as to teaching loads and the possibilities of such programs.

Causes

It has been intimated in an earlier section that the causes of educational retardation are not too evident. There are many mild causes, drawn from a great variety of fields, and often operating in combination. Studies of children in the Oakman School for Crippled Children showed that they averaged two other minor defects in addition to the orthopedic defect, and the same number holds for other conditions among all children examined psychologically at the Detroit Psychological Clinic. It is the writer's belief that a combination of mild defects may be as serious a handicap as one major defect. The development of special education for the handicapped found it necessary to proceed along single, specialized lines in their pioneering stages such as sight-saving. With the increasing knowledge of children's disabilities, a different type of class and program needs to be developed for combinations of defects.

Physical causes. Educational retardation is intimately associated with mild physical handicaps. The child who has a slight hearing defect which is uncorrected, or for which little allowance is made in school, misses much of the discussions and explanations, and hence he does not profit so fully as the child with normal hearing. The cumulative effect of this deficiency over a period of several years becomes very great. The child with a mild vision defect which does not qualify him for a sight-saving class suffers in a similar degree. He tires easily, cannot see the written material in the front of the room on mounts or on the blackboard, and becomes discouraged. If his eyes do not properly fuse the images from both of them, untold confusion in images results. In like manner mild orthopedic handicaps, speech defects, lowered vitality, and all of the other physical causes contribute their quota of causes to educational retardation. Wherever possible, health programs should not only concentrate upon the extreme types of handicaps but upon the mild ones as well so as to reduce educational retardation.

Mental and psychotic causes. Disabilities in educational achievement are intimately but more obscurely related to mild mental and psychotic causes. The *petit mal* type of epilepsy which is not detected may contribute heavily to such retardation. The encephalitic, the prepsychotic, and the mildly psychopathic also swell the ranks of nonreaders.

In the psychological field, more attention needs to be concentrated upon the composition of mentality rather than merely upon the general mental level. Psychological testing shows a typical range of abilities centering around a midpoint and with some individuals showing much more scatter or range than others above or below their average. It does not solve a child's mental problems when his general mental age is found to be ten years, without knowing that he may be no more than seven years mentally in all tests of auditory attentive ability for spans of words, numbers, or sentences. More details about these possibilities will be presented along these lines in the following chapter.

Emotional and personality causes. In an earlier section of this chapter various personality and social characteristics of the educationally retarded were noted to be very commonly associated together. Which is cause and which is effect is not known, one may cause the other and in the more chronic cases they are closely interwoven. In the Montefiore School for problem boys in Chicago about 25 per cent are cases of reading disability. Similar figures are available for other schools and classes for behavior cases. In a Detroit study, Powell [1] found that one-fifth of a control group who suffered from uncorrected educational retardation later found their way into behavior classes, whereas only 4 per cent of the experimental or treatment group were so placed. It is quite evident that a preventive program has marked effects upon deviations of character, personality, and social adjustment. A long time program of delinquency prevention is to be found in remedial education.

It has been noted that educational retardation thrives in cases where mild defects of other types are not corrected. Whenever these mild defects occur in combination the number of such cases increases rapidly. One of the best and most effective mental-hygiene programs centers in an efficient program of remedial instruction which takes into account the total child and his disabilities in all fields.

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[1] H. F. Powell, "Social Adjustment as Related to Reading Disability," Master's thesis, University of Michigan, Ann Arbor, 1943.

History of Educational Retardation

Since education was not very universal up to a century ago the history of educational retardation does not contain many marked examples of such backwardness. In the writings of various famous persons are to be found imperfections of spelling, writing, and grammar which do not follow the modern standards of today. The writings of Leonardo da Vinci are generally in reversed direction from right to left, capable of being read most easily in a mirror. It was believed that he had a paralysis of his right hand and in adult life learned, as best he could, to write with his left hand from right to left.

Many of the early tests by Cattell, Whipple, Binet, and others attempted to devise an analytical breakdown of the psychological picture so as to explain educational disability. Bronner's *The Psychology of Special Abilities and Disabilities*,[1] published in 1918, reviewed the work of earlier psychologists in mental fields and in specific fields of subject matter. The writer's study [2] of educational disability based on sixty cases was undertaken in 1924–1925 under the general direction of Dr. Charles S. Berry. Brueckner and Melby [3] published their book on *Diagnostic and Remedial Teaching* in 1931.

In a 1946 study of *Why Pupils Fail in Reading*, Robinson [4] made a summary of causes under the following headings: (1) visual maladjustments, (2) neurological bases, (3) auditory and speech difficulties, (4) physical deficiencies, (5) intelligence, (6) emotional and personality problems, and (7) environmental and social characteristics. The findings on an intensive study of thirty cases were interpreted according to the previous standards and also by the conference of specialists. Pupils were treated for varying periods of time and results ranged from a few who seemed to make little or no progress to some whose reading progress was quite satisfactory.

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[1] A. Bronner, *The Psychology of Special Abilities and Disabilities*, Little, Brown and Company, Boston, 1918, 269 pp.

[2] H. J. Baker, *op. cit.*, 1929, 172 pp.

[3] L. J. Brueckner and E. O. Melby, *Diagnostic and Remedial Teaching*, Houghton Mifflin Company, Boston, 1931, 598 pp.

[4] H. M. Robinson, *Why Pupils Fail in Reading*, University of Chicago Press, Chicago, 1946, 257 pp.

Current Problems

Wherever school systems do not have provision for the usual types of handicapped children there are likely to be special coaching teachers who have a large number of all kinds of cases put into one general adjustment room. As school systems establish a liberal department of special classes the number of cases of educational retardation may be reduced to the place where the other types of special classes begin. In small cities it would be feasible to have a teacher travel between several buildings, and in very small areas the special teacher could devote part time to teach regular classes.

In larger systems it is more economical to have coaching teachers arrange their programs similar to those of speech correction, in which pupils enroll in regular grades but report to the special teacher one or more periods per week for remedial work. In this manner the teacher may carry a much larger number of pupils per week than if they are taken by her for full time in a special class. Actually about twice as many are handled in this manner, and the turnover is more easily made than when they are in the special class full time.

On account of the relative ease of administration of such a program it is to be wondered why such classes are not established more frequently. It is believed they will have a rapid development when their functions are better understood and teachers are specially trained to carry an efficient program. Under ideal circumstances these classes should yield a larger return than most other types, not only for the pupils but for their happiness and that of their parents.

Results of the Early Detroit Experiment

One of the advantages of modern experimental work in education lies in the possibilities of individual longitudinal studies of the same children over a period of years. The Harvard Growth Study by Dearborn, and studies of gifted children by Terman and by Sumption, are valuable examples which have previously been quoted. On a much more modest scale the writer has been able to secure some records on practically all of the sixty cases in the 1924–1925 coaching experiment until they finished school. It will be recalled that at the time of the coaching they were nine years of age and mostly in the third and fourth grades. These results have never been published to date.

With regard to grade eventually reached, nine of the sixty finally left school when enrolled in the eighth grade or lower, twenty-three were in grades nine to eleven, and twenty-seven were in the twelfth grade or in college, and one could not be located within a year or two after the experiment was closed. Nearly one-half of the total reached the twelfth grade or college, which is higher than the proportion of the general pupil population of that time. It is evident that coaching must have been a very practical aid to them when they were failing and discouraged at an early age and many years before they were ready to finish school.

There are some interesting relationships between the final grade reached and the early characteristics of these children. Intelligence had some mild correlation with progress, since the eighth-grade group or lower had a median I.Q. of 88, the nine-to-eleven grade group 92, and the higher group 95. There was a trend toward arrested mental development in the lower group with four of the nine cases having second individual examinations subsequently and with I.Q.'s falling from ten to fifteen points from the first examination. In the group reaching the highest grade, three of the cases had ratings on group test I.Q.'s at later times which were higher correspondingly than the I.Q. at the time of coaching.

The influence of the nonintellectual factors was probably more important than the mental ratings in helping to determine eventual school success. Of the lower group all nine had been characterized at the time of coaching as "poor" or "very poor" in traits of character and personality, eight of the nine had homes which were uncooperative with the school, and the ninth was only fair or neutral in attitude. Among these nine cases there were many physical disabilities and other unfavorable circumstances, described as general bodily weakness, nervous, dirty, ragged, sleepy, shiftless, tardy, poor vision, paranoid trends, and similar characterizations. These unfortunate cases are among the best illustrations available of mild defects operating in combination which nullify efforts of schools. None of these cases qualified for any of the usual types of classes for physically or mentally handicapped children.

The characterizations of the twenty-seven children who reached either the twelfth grade or college presented a much more favorable picture. Only five of the home attitudes were uncooperative, three were poor or very poor in home status, while the personality and physical deviations of the children were of a much more minor nature. Among these difficulties were overstimulated children who were constantly admonished at home to hurry so as to do better schoolwork, two who were babyish and immature, and three with speech defects. As a group, they were more nearly free from these nonintellectual factors than the two groups which did not go that far in school.

A vivid example of a case complicated by neurological disorder whose real nature was not too readily recognized at the time came to light in the subsequent history. The boy was described as lacking in self-control, continually removing his glasses, tying his shoe laces, fixing his hose, and playing with various small toys which he always carried in his pockets. He interrupted all regular classes and coaching activities to pick up books and other materials which he had forgotten or misplaced. Five years after the end of the coaching period he died of spinal meningitis at the age of fourteen years. His case is described as Number 12 in the writer's *Educational Disability and Case Studies in Remedial Teaching.*[1]

The various investigations which have been cited describe types of educational retardation which do not qualify for enrollment in the other types of classes for the exceptional. They represent a residue of the mild defects in combination left over from classes which handle more extreme cases in the various fields. Their educational retardation is equally as serious as that of more marked cases in single fields such as vision handicaps, but their problems do not seem to be so obvious because they tend to be minor in several fields.

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[1] H. J. Baker, *op. cit.*, pp. 100–102.

In the following chapter some of the specific problems in actual coaching in various school subjects will be presented in order to show what has been accomplished and to outline future possibilities.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Report in more detail upon Baker's *Educational Disability and Case Studies in Remedial Teaching*.
2. Describe some cases of educational retardation you have known in the light of this chapter.
3. Summarize the text by Brueckner and Melby.

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Chapter XXVIII

REMEDIAL PROGRAMS IN EDUCATIONAL RETARDATION

Educational retardation occurs in all fields of instruction. Most of the experimental work has been done in the four fundamental subjects of handwriting, arithmetic, spelling, and reading, with particular emphasis upon reading as the most important tool subject. Retardation also occurs in all of the other fields: history, music, languages, health education, and vocational subjects such as manual training, domestic science, art, and allied activities. In all of these latter subjects there has been less experimentation about educational retardation for various reasons: they are often elective rather than required subjects and pupils with marked disabilities learn how to avoid them as far as possible; also, instructors anticipate a certain per cent of failure among students in such courses and fail those with special retardation. However, there is an increasing number of teachers and specialists in subject matter who are devoting time to the problem of educational retardation in these subjects. Up to the present more experimentation has been undertaken in the tool subjects noted above, although Brueckner and Melby [1] devote considerable space in their *Diagnostic and Remedial Teaching* to the special subjects as well.

Handwriting

In the popular mind handwriting is a subject of little consequence and entirely incidental to success or failure in life. It has even been argued that handwriting is negatively or inversely related to intelligence, a point of view which may build up the mental status of poor handwriters and furnish an alibi for lack of effort to write well. The early methods of teaching handwriting placed little premium upon intellectual effort. The routine drills to develop muscular coordination were deadening to the brighter individual who naturally possessed these traits to a high degree if they could be motivated sufficiently to bring them to light. According to present knowledge there should be a high positive correlation between intelligence and handwriting.

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[1] L. J. Brueckner and E. O. Melby, *Diagnostic and Remedial Teaching*, Houghton Mifflin Company, Boston, 1931, 598 pp.

Diagnostic procedures. One of the early procedures for the evaluation of handwriting was the Ayres'[1] Handwriting Scale, still in common use, and which offered samples of handwriting ranging from scores of 10 to 90 in quality, with grade norms for the number of letters per minute. Freeman[2] and Nystrom[3] have offered schedules of specific diagnostic measures covering such points as slant, spacing, irregularities, color or shading, form of letters, size, and beginning and ending of strokes. Many of these deficiencies are treated in the program of regular instruction.

Psychological analysis. From the standpoint of pupils' abilities there are some relationships to success or failure in handwriting. In general, those who are poor in motor control and muscular coordination have difficulty in the mechanics of writing, and vice versa. These psychological and physiological factors are distributed among the population according to the general curve of frequency with a few cases at each extreme, more who deviate less extremely, and a large group clustering around the mean or average. These motor and muscular traits in turn are based upon many factors such as were discussed in the chapter on Growth.

Poor orientation in time and space relationships is related to inadequate handwriting. The child who is at a loss in his general sense of direction and as to his location in his immediate environment is equally handicapped when he begins to write any letter or word. He does not know whether to move up or down, or horizontally. His writing is characterized by aimless wandering and great hesitation whenever a turn, a curve, or a reverse movement is expected. The good writer enjoys high scores in visual tests and in general visual planning well above the level of his other mental faculties, so that he writes well because he has a clear and concise image of what he is about to write. He can visualize just how a letter or word is going to look and he merely copies this mental image.

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[1] L. P. Ayres, *Ayres Measuring Scale for Handwriting*, Gettysburg ed., Russell Sage Foundation, New York, 1915.

[2] F. N. Freeman, *Charts for Diagnosing Faults in Handwriting*, Houghton Mifflin Company, Boston, 1914.

[3] E. C. Nystrom, *Minneapolis Self-Corrective Handwriting Charts*, St. Paul Book and Stationery Company, St. Paul, Minn.

Those who are poor in handwriting are below the average of their general mental level in tests of associative processes which indicates that, contrary to popular opinion, highly associative processes are called into play in handwriting. A little thought shows this logic, since there must be comprehension and understanding of what is to be written, the materials for writing must be in order and well coordinated, the memory of each letter or word must be called into play and associated with the motor movement itself, and all distracting influences must be ruled out if handwriting is to be satisfactory. Under such circumstances handwriting is not the purely automatic habit which it is often assumed to be, but a highly associative mental process.

Other factors. In addition to these factors there are also present the various personality and social maladjustments which are usually associated with educational retardation. A child may give little attention to his schoolwork, including his handwriting, for many reasons such as are cited in Part V on Behavior Adjustments. He may become completely discouraged about school failure, he may be scolded at home for a poor report in handwriting, and many other issues conspire to condition him unfavorably toward handwriting. These mechanisms work with equal effectiveness in all school subjects.

Under all of these circumstances it is easily understood why there is at least a minimum number of cases needing remedial treatment in handwriting. This rehabilitation does not take place effectively unless attended by knowledge of the various special mental disabilities and the proper treatment of the social and emotional factors as well.

Arithmetic

Arithmetic is a subject of fundamental importance throughout school life and in the adult world. Practical education is often judged on knowledge of simple arithmetic rather than on the total number of acceptable credits which a pupil may have accumulated in high school and college in many advanced subjects. In order to avoid these criticisms some school systems are now requiring a refresher course in the fundamental subjects in the senior year of high school. Arithmetic is the science of numbers and, as a science, it is specific, definite, and capable of being mastered, one step at a time, in a proper sequence of topics in logical order.

Diagnostic procedures. Arithmetic is divided into two main phases: the mastery of fundamental processes with their combinations, and problem solving. In both of these areas, particularly the former, there have been literally hundreds of diagnostic tests devised. Various books cited in the list of references in the bibliography cover many phases of this field.

Psychological analysis. The psychological analysis of pupils' abilities is an important area to be taken into account in the diagnosis and remedy of arithmetical retardation. In the writer's study of the 1925 coaching group [1] a high relationship was found between arithmetic and visual imagery. It is evident from this fact that unless a child gets a vivid mental picture of number, measurement, or quantity, he is at a loss in arithmetic. If the number "3" is being considered, he should be able to visualize three things, such as three apples, and see them as being more than two and less than four. After such mental pictures are established he may drop them into the mental background and call them up only when some new and more complicated situation arises. When these visual imagery processes do not function, even in the early stages of numbers in the lower elementary grades, arithmetic becomes an abstract subject to be mastered by rote memorization and without much meaning. These relationships became apparent in the analysis of the Detroit cases in which the high and low spots in the psychological picture or profile disclosed the correspondence between success or failure arithmetic and visual imagery tests. Since then the writer has observed many cases in the psychological analysis of adults who tried to discover why their number abilities were so deficient when their general mental abilities were of a high order. Practically all of them made very poor scores on tests of visual imagery.

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[1] H. J. Baker, *Educational Disability and Case Studies in Remedial Teaching*, Public School Publishing Company, Bloomington, Ill., 1929, pp. 41–45.

Tests of association are also related both to poor mastery of combinations and to the selection of incorrect processes in problem solving. As in the case of handwriting, what at first appear to be simple processes are actually found to be complicated when subjected to more detailed analysis. Mastery of vocabulary is closely related to problem solving, since the exact meaning of words is an important part of this process, and it comes to light particularly in such tests as Stanford Achievement.

In addition to these psychological deviations which disrupt learning, all of the social, emotional, and allied factors play their insidious role in arithmetic. There are a few children who have a genuine fear of numbers, and their minds become blank as soon as they are asked to study arithmetic. Others have been told that one parent never could learn numbers and they had probably inherited the same difficulty. This belief is open to much question and needs proof before acceptance. One case of this kind was convinced to the contrary and, fortified with an I.Q. of 110 and no disability in visual imagery, she made three semesters progress in one semester's coaching.

In the early days of teaching arithmetic, there were long periods of rote drill on all the fundamental combinations before any problem solving. This procedure was uninteresting and often tolerated more by the slow-learning than by any other group so that they actually equaled or excelled some of the average and superior children in these processes. Eventually success shifted to the rapid-learning groups when problem solving arrived later on the program. The present trend is in the direction of introducing simple problems concurrently with mastery of combinations, which makes the latter more meaningful and also makes the entire process much more interesting. This practice is parallel to the current plan of teaching easy music pieces as soon as a few of the first principles and fundamentals of music are understood.

Spelling

Spelling is another of the fundamental subjects which unfortunately has been relegated to the status of a "tool" subject to be learned incidentally. Although general surveys over a long period of years show that the world today spells better than formerly, caustic comment in the press and elsewhere about poor spelling has focused fresh attention upon it. Naturally those below the median in spelling seem to be retarded in that subject. A small percentage of superior adults who have special disabilities in spelling magnify backwardness in that subject by their noisy and concentrated protests. A few generally good spellers raise an unjustified clamor about their spelling disabilities out of proportion to the small number of words that they misspell. After allowances have been made for these claims and general trends there is to be found a small percentage of children with unusual retardation in spelling.

Diagnostic procedures. The English language with its unique phonetic system offers more opportunity for misspelling than many other languages. In the process of teaching, these errors need correction with explanations of why they are likely to occur, for those who may understand them. There should be more drill and repetition for the slow-learning when such simplified explanations fail.

Brueckner and Melby[1] cite a list of 24 difficulties encountered by 275 pupils of a school system. They list the most frequent as "Has not mastered the steps in learning to spell a word," with 88 times, and an equal number of "Writes poorly;" 78 cannot pronounce the words being studied, 71 had bad attitudes toward spelling, 49 did not associate the sound

[1] L. J. Brueckner and E. O. Melby, *op. cit.*, pp. 396–399.

of the letters or the syllables with the spelling of the word, and so on. Gates[1] listed twenty-two specific causes under five general headings as follows: defects or deficiencies of training; unfavorable behavior; general; defects of sensory mechanisms; defects of motor mechanism; and defects or deficiencies of connecting mechanisms.

Nichols[2] devised a test for the analysis and correction of spelling difficulties, consisting of subtests on spelling achievement, proofreading, word meaning, handwriting, visual discrimination, and auditory discrimination. Remedial instruction was instituted for four months on a group of 173 third-grade pupils out of a total of 423, or 41 per cent, who fell below the city average. Retesting on an alternate form showed a substantial reduction in the number of subtests failed and an increase in the number reaching the city mean in Manchester, New Hampshire. It was concluded that the test was effective in analyzing spelling errors and in determining the effectiveness of remedial instruction.

Psychological analysis. In the analysis of successes and failures in the Detroit coaching experiment some interesting relationships to psychological factors came to light. Knowledge of the vocabulary of what was to be spelled was of first importance. It was doubly related; namely, poor spellers had poor vocabularies and good spellers had good vocabularies. Haste and careless performance on tests of insight and judgment were related to carelessness in hastily putting down letters in any chance order. Transpositions of letters were related to poor orientation in time and space relationships, auditory weaknesses were matched by difficulties in phonetic methods.

From these facts it is evident that spelling is not the simple "tool" subject formerly supposed. There are many causes of spelling disability, and these causes may be hopelessly interrelated in children suffering from spelling disability. It is necessary to make an intensive individual study of such cases and plan an appropriate remedial program if spelling disability is to be reduced.

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[1] A. I. Gates, *The Psychology of Reading and Spelling*, Teachers College, Columbia University, New York, 1922, p. 89.

[2] A. M. Nichols, "The Analysis and Correction of Spelling Difficulties," *Elementary School Journal*, 1949, **50**, pp. 154–161.

Reading

It is generally agreed that reading is the most important tool subject in the elementary curriculum since it is basic to progress in practically all other subjects. One cannot complete a project in a machine shop, or bake a cake in the cooking class without being able to read instructions understandingly. There has been more emphasis upon methods of teaching reading and upon remedial procedures than in all of the other fields together.

The teaching of reading has gone through many steps in evolution during the past fifty years. As a result, many methods of teaching have been devised. The early method of first learning all the letters of the alphabet and then putting them together into words has been generally superseded by methods which pass directly to larger units such as short words, or to phonic units. The teaching of reading has suffered from much experimental work being done in centers where the children were superior in ability and cultural status. Whatever proved successful with these children became the standard for less favorable groups, but with meager success. Emphasis has also shifted between oral to silent reading with added attention to the former in recent years.

Diagnostic procedures. Brueckner and Melby[1] list diagnostic devices under group measurements and individual diagnosis. There are tests of reading readiness, tests of achievement, and many phases of testing for specific remedial situations. They list seventeen different tests which furnish the basis of their discussion of diagnosis in reading.

In his book *The Prevention and Correction of Reading Difficulties*, Betts[2] cites ten main areas of research in the prevention, analysis and correction of reading difficulties as follows: I. Maturation, II. Vision, III. Hearing, IV. Kinesthesia, V. Language, VI. Emotional, VII. Sex differences, VIII. Pedagogical, IX. Psychological, and X. External. He discusses each of these areas in detail with many specific steps in remedial work. Maturation includes defective cerebral development, delayed cerebral development, confusion of cerebral development, associated with hand and eye preference, physiological and psychological readiness, interpupillary distance, and background of information. Betts has developed a series of Visual Sensation and Perception Slides in his *Ready to Read Tests* to be administered through an apparatus known as the Keystone Ophthalmic Telebinocular. One of the purposes of these tests is to determine how well the images from the two eyes fuse or coordinate into one clear picture. If this does not occur, the child gets a confused image of words or letters in trying to read, even though each eye tested separately may show perfectly normal vision. This type of apparatus and its diagnostic possibilities cover only one phase of reading, but many enthusiastic followers tend to ascribe to it much more general remedial powers than its author has ever claimed.

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[1] L. J. Brueckner and E. O. Melby, *op. cit.*, pp. 247–331.

[2] E. A. Betts, *The Prevention and Correction of Reading Difficulties*, Row, Peterson and Company, Evanston, Ill., 1936, 402 pp.

Another important source of difficulty is the close relationship between seeing words or letters in reverse order and interference with normal handedness, and in some instances with speech defect. It has been noted in earlier chapters that there are subtle connections, particularly between reversals and handedness. Orton proposed a theory that the visual images reaching the cerebrum are received in both direct and mirrored form, but that in normal handedness one or the other of these images is ignored by concentrating the attention on one only through some process of lateral cerebral dominance. In cases where change of handedness has been forced, and in the ambidextrous individuals, these dominances do not become definitely established. As a result there is continued confusion of symbols. By determining the basic handedness and allowing its natural operation, whether right or left, and with emphasis upon the flight of vision from left to right on the printed page, many of these problems may be remedied if done very carefully and in a thoroughly scientific manner.

The psychological disabilities are also a matter of great importance in various methods and approaches to the teaching of reading. In the writer's data, reading disability cases who were particularly weak in attempts to learn phonics were also below their general mental level in vocabulary, in association, and in both visual and auditory attentive ability. In other words, if a pupil is to be taught by phonic methods, he must have a good vocabulary as a foundation. He must also have good auditory attentive ability for sounds and good visual attention to the appearance of the units, and, finally, he must be able to associate them quickly, easily, and accurately. It is little wonder that many children fail by the phonic method. Likewise other methods have their combinations of psychological disabilities which lead to failure. The moral of such findings is that no one method is the proper and only way to teach all children. Until such time as teachers have instructions in many methods and liberty to use those that are found suitable to certain types of pupils, educational retardation in reading will continue to occur.

Attention is also called to the fact that emotional, social, and other factors play an important role in reading disability. They become particularly pronounced after the reading failure has reached an aggravated stage. In such cases the program of mental hygiene by trained workers must parallel the efforts of the coaching teacher and be closely coordinated with them. Remedial instruction in reading as well as in other subjects must be approached from many points of view and is by no means a simple problem involving only one area of activity or instruction.

At the outset it was mentioned that reading disability has far-reaching consequences since reading is the basic tool in all other subjects throughout school life. The fact that it is difficult to correct after it becomes established shows how grave a problem it may become. It is actually one of the most serious problems that modern education has to face, and one which has been accepted with too much complacency and as inevitable. Both of these assumptions are contrary to fact in the light of extensive investigation and standardization of remedial techniques.

Other Subjects

It was noted at the beginning of this chapter that educational retardation occurs in all subjects. All of these problems should be approached with care and analytical procedures. For students and teachers who are interested in specific school subjects, basic texts usually have references and one or more chapters devoted to remedial measures.

Results

Whenever coaching on cases of educational retardation is undertaken in a serious way and by specially trained teachers, satisfactory results are obtained. In the 1937–1940 reading experiment in Detroit practically all of the 250 children were restored to a reasonably satisfactory reading level in from one to three semesters. A few of them had practically hopeless combinations of educational, psychological, social, and emotional factors with lack of home interest or cooperation.

In the 1924–1925 experiment which lasted only one semester, results were as follows: [1]

1. There was a gain of about seven months in general educational age in four months' time by these (sixty) coaching cases.
2. The improvement or change of educational with respect to Binet IQ and MA has been presented, and a technique has been developed for summarizing these relationships.
3. Of the thirty-nine cases coached in arithmetic, nineteen or 48.7 per cent raised their marks to a satisfactory standard.
4. Twenty-two cases were coached in spelling, but only nine or 40.9 per cent made a satisfactory restoration.
5. Twenty-two cases were coached in reading but only eight or 36.7 per cent made a satisfactory restoration.
6. The six cases coached in handwriting all made satisfactory restoration or 100 per cent.
7. In all subjects, 40 restorations out of 89 disabilities or 44.9 per cent were achieved.

It should be noted that the coaching period was of a short duration for one semester. The coaching teachers felt that in some of the more difficult cases further time was needed since the disabilities had become chronic after three or more years of discouragement and failure. It was interesting to note that even without further coaching in the subsequent follow-up two years or more later, some of these cases who had shown little immediate improvement began to make satisfactory progress. This phenomenon of a "delayed" rather than an "immediate" improvement has been noted in other areas such as case work on delinquent children.

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[1] H. J. Baker, *op. cit.*, pp. 77–78.

Educational retardation is the by-product of minor disabilities drawn from many fields. All types of handicaps cited in earlier chapters contribute their quota of causes even in mild form. The fault does not lie entirely at the door of those who build courses of study for general use, but partly in individual children and their unique abilities. The psychologist and adjustment worker must cooperate with such curriculum builders and with teachers to bring about improvements.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Discuss a case of educational retardation and give the probable diagnosis.
2. Report on Betts' text, *The Prevention and Correction of Reading Difficulties.*
3. Discuss selected cases from Baker's *Educational Disability and Case Studies in Remedial Teaching.*
4. Visit the class of a remedial teacher and arrange for a demonstration.

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4. Betts, E. A., *Foundations of Reading Instruction,* American Book Company, New York, 1946, 757 pp.
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Part VII

General Problems, Summary, and Conclusions

Chapter XXIX

GENERAL SCOPE OF THE PROBLEM

In the discussions of exceptional children throughout the various chapters emphasis was necessarily pointed in the direction of each type taken one at a time. Significant phases of each type were presented. In the present chapter the process will be reversed with emphasis upon topics instead of types. Through this approach a general review will be made possible, as well as a summarization of the relationships between all types of the exceptional children.

The Training of Teachers

The training of teachers for exceptional children has been one of the major problems in the development of an adequate program. Often a school system has been forced to abandon its proposed program for some type of special class when no teachers were available in that particular field. In the early days of special education few centers offered any training for special education since there was very little call for them. Likewise school systems hesitated to establish classes because they could not find trained teachers. This vicious circle is gradually being broken, mainly by school systems establishing the classes with their teachers taking the training while in service. Many of the earlier courses for special education were given only in summer schools or as evening and extension courses from large centers. As the demand for teachers grew and undergraduate students without teaching experience began to elect special education, there has been a gradual development of a recognized curriculum in the day program during the regular school year. Momentum is gradually gained both for the training of teachers and for the establishment of classes with the knowledge that properly trained teachers are becoming available.

In the White House Conference Report there was a subcommittee on the training of teachers that urged differential recommendations depending upon the requirements for regular teachers which varied from state to state, and between cities and smaller communities. Their general optimum recommendation was at least thirty hours of specialization, which has now been adopted in Michigan and in some other states. The Michigan committee also recommended that candidates should have at least two years of regular grade teaching before specializing with the handicapped. In 1938 the United States Office of Education [1] issued a bulletin listing universities, colleges, and other training centers in which various types of special education teachers might be trained. That report is not only informative as to places of training but as to the extent of courses now being offered.

Schleier [2] reported on *Problems in the Training of Certain Special Class Teachers* in 1931 on rulings of state boards of education concerning the preparation of special-class teachers. He noted that in eleven of twenty-four states that had some legislation concerning the establishment of special classes, there were certain standards for teachers with a few requiring special licenses and training varying from one or two courses up to a full year of thirty hours. His report on where courses were offered was roughly parallel to the Office of Education Report. Wallin [3] brought information along these lines up to a more recent date in 1938.

The Department of Public Instruction of Michigan issued a bulletin in 1942 [4] approving thirty hours of specialization as the minimum for teachers in that state. For all types there should be a survey course of four hours credit, six hours selected from mental and educational testing, guidance and occupational information, speech correction, mental deficiency, delinquency, abnormal psychology, anatomy, social psychology, social psychiatry, social pathology, child welfare or equivalent, and others; four hours for most groups in arts, crafts, and others; four hours of directed teaching; from six to twelve hours in medical and physiological aspects of their particular field depending upon the field and how completely courses have been developed in it.

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[1] U. S. Office of Education, *Opportunities for the Preparation of Teachers of Exceptional Children*, No. 17, Government Printing Office, Washington, D. C., 1938, 58 pp.

[2] L. M. Schleier, *Problems in the Training of Certain Special Class Teachers*, Teachers College Contributions to Education, No. 475, Columbia University, New York, 1931, 138 pp.

[3] J. E. W. Wallin, "Trends and Needs in the Training of Teachers for Special Classes for Handicapped Children," *Journal of Educational Research*, 1938, **31**, pp. 506–526.

[4] E. B. Elliott, *A State Program of Special Education*, Superintendent of Public Instruction, Lansing, Mich., 1942, 19 pp.

It was a very striking phenomenon that during the days of the greatest general teacher surplus there was a shortage of teachers trained for special education. When there is a general shortage of teachers the problem becomes very acute. This law of supply and demand is becoming better understood with the resulting increase in the number preparing for special education work. By raising the requirements for professional training of special education teachers, there is a tendency to raise the level of training for all regular grade teachers as well.

Teachers of regular classes should have at least one introductory course in exceptional children for two important purposes: (1) so as to recognize the main symptoms and detect possible candidates from among their pupils, and (2) so as to be fully informed about, and be sympathetic with, the program of special education.

The Feasibility of Classes

There are all kinds of attitudes about the establishment of special classes in various communities. The responsibility for policies generally rests with the superintendent of schools acting under the advice and authority of boards of education. The problem is often declared impractical on account of the small number of pupils, crowded conditions, and various similar circumstances. For every such situation there is another one identical to it in which classes are established and successfully maintained. It depends mainly upon the enthusiasm of the administration and its knowledge of children and their needs. In discussing the many types of handicaps in earlier chapters the size of cities which might maintain classes has usually been indicated, together with the prevailing trends which are making slow but encouraging progress.

There are many types of exceptional children to whom teachers might be assigned for part time with the remainder in some field of regular teaching. There are other situations in which the special teacher might devote part time to two different types of handicaps for which she has had training. If there is genuine enthusiasm for handicapped children, there are many possibilities of a program for special education suited to their needs.

The Number of Exceptional

The question of how many exceptional children there are is complicated by the surveys which have been made within each field, independently, and without much regard for each other. This grand total has been computed and obviously more children are listed than exist with single handicaps. If it is assumed that each exceptional child has an average of three defects, the total number of children would be overestimated to three times its actual number. In the White House Conference it was estimated that ten million children were handicapped or about 22 per cent of the total. If this number is three times as large as it should be, there would be about 7 per cent of children as candidates for special classes and schools. It is interesting in this connection that the Detroit Public Schools make provision for approximately 7 per cent of its school population in handicapped classes, although there are potential waiting lists in most fields above this number.

If the originally estimated number of the exceptional is too high, the reduction to one-third is probably too low; possibly one-half of the original estimate or five million would be more acceptable. It will be necessary to secure more careful surveys, with a listing of each child's defects, before an accurate count of different children with handicaps can be established. It should be remembered that since many children have three handicaps, the total amount of handicapping actually amounts to as much as if three times as many children each had one handicap, and these combinations have more profound effects than single handicaps operating alone.

It is a matter of interest to consider the possible combinations of the various types of handicaps. If it is assumed that there are approximately twenty different kinds of handicaps which are of such a nature that any three may exist together in any individual, there are 1140 different combinations of twenty different things taken three at a time. In other words, if a school system had provision for 1140 different handicapped pupils, no two would necessarily have the same combination of three defects, such as crippled, speech, and vision defects. In any classroom of twenty handicapped pupils, the chances of any two having the same combination of defects is extremely rare. It becomes an important challenge to special teachers to meet situations of this kind. If there are approximately five million exceptional children, there would be about five thousand with each combination of defects in the entire country.

The Overlapping of Handicaps

One of the most effective reasons why there should be a broad point of view is the fact that exceptional children seldom have a single handicap to be treated in a special class without regard for other types of defects. While some one type of handicap may be so outstanding as to become the determining factor, the other disabilities must be taken into account also. In practically all fields of the exceptional there is an average of at least two other handicaps per child. In the rank and file of thousands of cases passing through the Detroit Psychological Clinic annually, there is an average of two other defects in addition to the one serving at the basis of referral. In Lee's study of the Oakman Crippled School population there was an average of two other defects besides the main orthopedic condition.

Such overlappings have several implications: first, most exceptional children have more handicapping than the enrollment in one type of special class would imply. If the second and third handicaps are comparatively minor, their combined effects may be as disastrous as the major handicap itself. The second implication is that special teachers should be aware of the problems in all fields of the exceptional since in any typical special class, such as sight-saving, practically all other types of handicaps are represented in some degree. The third implication is that, wherever possible, a series of different types of special classes should be assembled at one place so that children may have the benefit of all necessary types of special education.

The Cost of Special Education

From the administrative point of view the costs of special education are a very important factor. Such education is generally more expensive, often mounting to two or three times as much as for regular-grade children. When budgets are limited, there is a temptation to economize at points where the greatest showing can be made. However, the soundest policy is to provide an education suitable to each child, regardless of the cost. At best education is not expensive, and this is true of special education. The costs of special education should be computed not on the total but upon the difference between regular and special education.

For many types of exceptional children there are special state subsidies to cover the additional expense of such education. Wherever these subsidies have not been established, there should be a campaign for them, and all types of the exceptional should be included. Even without subsidies adequate educational provision for the exceptional discloses a humanitarian point of view and engenders a good will toward education which cannot be secured in any other way.

Marginal Cases

One of the most serious problems facing teachers in the regular grades are children with mild handicaps, just above the upper limits of qualifications for various types of special classes. If 20/70 in the better eye admits to a sight-saving class, it is a question how much better off in the regular grades without the special teaching aids of the sight-saving class is the child whose vision is 20/60. As a matter of fact he is probably in a much worse condition. Some years ago an important administrative official remarked that he would have preferred to have his own children rather severely handicapped instead of mildly handicapped, since they would receive a much better education. Various bulletins have been cited throughout the text which give helpful advice to teachers of regular grades who have exceptional children enrolled in their classes.

Eventually it may be discovered that there should be classes of varying degrees of special treatment and segregation so that the prevailing practice of an all-or-none placement would eliminate any arbitrary line. The children with combinations of mild defects would undoubtedly profit from such classes or part time provisions.

Coordination Among Types of Exceptional

One of the greatest stumbling blocks to an efficient system of special education for the exceptional has been the lack of understanding and cooperation among those who deal with the different types. Even within any special group this trend has been noticed, such as different methods of teaching Braille to the blind, and the various methods of teaching the deaf. These differences grew up in a natural way when various pioneers developed methods independently of each other and without knowledge of what their contemporaries were doing. Eventually when the literature of investigations was assembled, and centers for the training of teachers were established, these differences came to light. There has been some hopeful progress toward more uniformity, but there needs to be some further experimentation before entire uniformity is achieved.

Another cause of differences lay in that pioneering in one field was copied in others with clashes based in part upon jealousy. These difficulties were particularly true in regard to legislation and special financial provisions, since it was often feared that funds and facilities which had been won at such a great cost for one type of the exceptional must now be shared with others. In many states special state aid is available for certain types of the physically handicapped and not for others, while very few make any similar provision for the mentally retarded, although their problems are equally as urgent. The recently proposed Pepper-Boland bill before Congress for a Federal subsidy for the handicapped applied only to the physically handicapped, and hence lacked support from many quarters. The bureaus for the Rehabilitation of Physically Handicapped Civilians, financed equally from Federal and state funds, perform an excellent service, but no similar service is provided for the mental, socially, or emotionally handicapped who are equally handicapped and who would profit equally from such a program. The sponsors of the present organizations are generally reluctant to extend the scope of their activities to these other groups or to have such enabling legislation become law.

Another cause of disagreement and distrust arose from placing children or adults in schools or institutions through an incorrect diagnosis and with the attendant difficulty of reallocating them to the proper placement. These errors have been particularly noticeable between the feeble-minded and such other types as the deaf, the epileptic, and the socially maladjusted. Without any reasonable foundation in fact, cooperation between the feeble-minded, the behavior types, and any other types of the handicapped has been particularly difficult. There has been an unjustifiable stigma attached to these two groups, although as a matter of fact among the various types of the physically handicapped there is much mental retardation. There has been much hopeful progress in these matters of coordination and cooperation, but much more remains to be done.

Public Relations

One of the most crucial tests of a successful program for special education of the exceptional is effective public relations. If a school system is conducted on a system of educational isolation from its community, it cannot be very successful with exceptional children. One of the finest opportunities for good public relations is an excellent program for exceptional children with the full cooperation of all community agencies. Many professionally alert school systems have recognized the importance of this opportunity.

It has been emphasized many times throughout the various chapters that unless exceptional children are given the benefit of optimum educational opportunity, they will become discouraged and fail in school as well as in the general development of their characters and personalities. Whenever this failure occurs not only is the child discouraged, but the dissatisfaction spreads to his parents, to his brothers and sisters, to other relatives, and even to neighbors and friends as well. Since there are several million exceptional children, neglect of their educational needs spreads dissatisfaction about education to many million citizens. Education can scarcely afford to have a minority, albeit a small minority, of its clients dissatisfied with its program. Special education is one of the best antidotes for such troubles and would be well worth the effort and price in terms of improved public relations alone, to say nothing of the increased efficiency and happiness of the children themselves.

There is a fine opportunity for good public relations with the medical profession, with the courts, with social agencies, and with a host of other organizations which are directly or indirectly concerned with children's welfare. In the causes, remedies, and preventions of various types of cases there was much discussion about allied groups whose cooperation must be sought and obtained if the program is to be successful. An effective program of special education is the best answer to any school administrator who wishes to develop and maintain good public relations. It vitalizes the entire school program and sets up community contact which extends much beyond the area of special classes.

Historical Backgrounds

In the discussion of all types of the exceptional, an understanding of historical backgrounds was emphasized. The present status of any type can be understood only in the light of its development, and its relationship to regular education and to other types of the exceptional. In some instances there were evidences of jealousy and mistrust between advocates of one type as compared with others. Within the various types there had been equally caustic disagreements as to methods of diagnosis between rival schools of thought, methods of teaching, and other activities. Some of these issues may have stimulated greater study and more critical evaluations, but in other instances, disagreements probably impeded progress within the group and in its relationship to affiliated groups and to the auxiliary aids from other agencies.

On the positive side there is much inspiration of a general nature in the great struggles which were made to overcome almost unsuperable odds, inspiration to specific cases currently suffering from similar disabilities, and the amazing success of a few individuals who rose to fame in spite of their handicaps. The pages of history are full of such characters, although their difficulties are seldom mentioned very specifically in political history. After tradition has been established, such as adequate education for the blind, it is carried along in part by the momentum of the tradition. It is hopeful that some of the more recently recognized types of cases are able to capitalize upon the bitter historical experiences of some of the other groups and avoid the pitfalls which beset their pioneering days.

Problems of Diagnosis

The fields of diagnosis for exceptional children are among the chief difficulties in a practical and effective program. Many fields of diagnosis are necessary, as noted in the various types of the exceptional. The physically handicapped obviously require the services of physicians, preferably those who have specialized in the various lines of disabilities. In smaller cities there are comparatively few physicians available for such programs. Although it is a medical matter, the schools must take an active attitude in order to have such medical facilities provided. At all times it is important that there shall be a practical and workable understanding between the schools, the specialist, the family physician, and the parents about diagnosis, the program of remedial work, and for general cooperation.

The teacher of the regular grades should always be alert for physical disabilities and should be encouraged to refer them for final medical diagnosis. Although she may be in error on some of her estimates, the physician or the school administration should always encourage her to continue her efforts even in the face of discouraging errors. Differences in opinions among adults should always be subordinated to the welfare of children.

In the field of mental diagnosis there are too few clinical facilities. Many school systems do not have established and recognized clinics, and others do not have adequately staffed clinics. Unless a careful diagnosis is made, there is always confusion about bona fide mental retardation, behavior maladjustment, and educational retardation. Whenever a class for the mentally retarded contains such a mixture of nondescript problems the teacher cannot make much progress, and the class gets a generally unfavorable reputation.

Wherever school systems are small, a part-time teacher with examining qualifications could carry on the examination programs. It might be feasible for a county school system to employ an examiner for a group of schools, or the plan could be extended to larger areas. Various private foundations and state departments of public instruction have established experimental clinics of various kinds which operate on a more efficient basis than when small communities provide little or no program at all. In normal times when good roads and motorized travel reduce time and distance, the consolidation of rural schools and of health facilities markedly improves the lot of exceptional children. Unless all of these problems of diagnosis are adequately solved, the program for exceptional children does not function and exceptional children are lost in their hopeless competition with children of regular grades.

QUESTIONS AND TOPICS FOR DISCUSSION

1. Report on and discuss the requirements for special teaching certificates in various states as to number of hours, courses, and so on.
2. Make an informal survey of any regular classroom to which you may have access and report on the probable number of children with defects, and how many defects and types of defects there are per child.
3. Consult the sources in the reports of the White House Conference on the costs of special education.
4. What factors favor a closer coordination in the program for all types of exceptional children, and what factors seem unfavorable with methods of minimizing them?
5. Give instances where parents have been dissatisfied with the regular program for their handicapped children.
6. Make a list of ways by which there could be better coordination about all fields of special education.

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Chapter XXX

DESIRABLE ATTITUDES TOWARD THE EXCEPTIONAL

In this final chapter there is little need for summarizing what has already been said as to each type of exceptional child. It is more fitting to turn attention to the attitudes which should be developed upon the part of those who deal intimately with such children. These include the school administrator, the regular and the special teacher, the children, and finally the general public whose children are the subjects of study.

The School Administration

Adequate educational programs for exceptional children are the responsibility of the school administration. The chief responsibility in this area lies with the superintendent. Under his general policies, determined by boards of education from facts and recommendations presented to them by the superintendent, it is his duty to administer the program of special education along with his other administrative problems. The success of the program is dependent mainly upon his enthusiasm, interest, and sponsorship. If he has the sympathetic support of the community and the board of education, the program will overcome many natural obstacles and be a success.

In large school systems the details of the program are delegated by him to administrative aides, to principals of buildings, and to supervisors of the various fields. His personal interest and enthusiasm must continue to function through these channels or there will not be the complete success which should otherwise be realized. In employing or promoting administrative staffs, school systems should carefully choose candidates who have had training or experience with exceptional children. Unless some firsthand experience or training has been gained, the program of special education offers enough problems so that there is a temptation to neglect this field in favor of more familiar territory. It should be remembered that the more time and effort that is put into a project, the more is likely to result from it, and special education is no exception.

The Special Supervisor

The special supervisor or administrator of classes for the exceptional has a very important role. His duties include not only the administration of the program but many phases which are closely related to other fields. It is necessary to keep abreast of texts and subject-matter presentations in all fields of instruction and adapt them to use in special types. For example, the acquisition of instructional material for Braille classes is a constant challenge. Likewise all of the special equipment and apparatus becomes his responsibility.

Suitable health programs as outlined by competent medical authorities are to be integrated into the school program and into the all-year program for children both in and out of school hours. Arrangements for transporting handicapped children to central buildings, lunches for them, problems of finance and special state aid, are included among their duties. In large cities these duties involve full-time work and include the nomination and selection of teachers, offering courses in special education in teacher-training centers, and many similar projects.

The Special Teacher

The special teacher is an important key person in the program of special education. She should be well trained and familiar with her own particular field and the other fields of exceptional children as well. It is assumed that all of the highly desirable attributes of good teachers should be highly exemplified in her attitudes toward her particular assignment. She must be proud of her class and impart a feeling of its importance to the regular teachers. If she lives in an apologetic frame of mind with regard to her work and her class, her fellow teachers in the same building or among her acquaintances are likely to despise both her and her class.

There should be a free and easy transition of exceptional children from the regular grades to the special classes, and vice versa. In most types of special classes there is opportunity for children to mingle with those in regular grades for certain subjects and activities. Unless the relationships between the special teacher and the regular teachers are most cordial and satisfactory, this kind of program will not function properly.

The special-class teacher must have unusual patience and understanding of children. As noted many times, most exceptional children have a combination of defects and often they have been subjected to ridicule by a world which is harsh and in which competitions are ruthless. It requires an unusual amount of enthusiasm and encouragement to neutralize these negative influences and to build a positive psychology for such children.

The problems of the special teacher are influenced by the attitudes of the school administration and the general attitudes which have been developed by tradition in the community. If one or more teachers who previously held these positions have been unsuccessful or have engendered undesirable attitudes, the task of the new teacher is doubly difficult. When the teacher is a pioneer in her community or school in the establishment of a special class, she has many problems to face, and the success or failure of special education in that school lies with her for many years after her initial years. Any special teacher who operates alone in a building in which there are many regular teachers encounters more problems than if she were one of a staff of several in a special school, such as a centralized school for crippled children. The teacher who prepares for the teaching of exceptional children must expect to face many of these problems and to take them in stride.

The Regular Teacher

As noted in the preceding chapter, all teachers should hav at least one introductory course in exceptional children i order to recognize potential cases among her pupils and to have a sympathetic understanding of the program of special education. Much of the success or failure of the special program centers around the attitudes which regular teachers assume toward the exceptional. It is important that teachers appreciate the fact that special education offers opportunities for exceptional children which cannot be realized as completely in the regular grades. If children and parents may be prepared in advance to feel that the special class is an opportunity, the actual transfer into such a class upon the recommendation of the authorized diagnostic agency will be greatly facilitated.

It may be difficult for teachers to realize that children have failed in regular classes because of some handicap of which the regular teacher may have not been aware. Such results are more likely in the case of comparatively mild defects and also in case of mental, neurological, and related causes whose exterior symptoms are not so obvious as is poor vision or an orthopedic condition. Children who show behavior symptoms because of too difficult school work, because of subtle eye strain or slightly impaired hearing, are not always viewed with the patience and understanding which are expected in the case of nonbehavior problems. However, the special classes or programs for them are just as much opportunities as any other type of case. In any event threats of special class transfers as a means of punishment are among the most undesirable practices and, fortunately, are limited to a very small minority of teachers. Whenever a teacher is fortunate enough to have a system of special classes available for her candidates, she should realize that her own success is increased if the potential failures have been removed from her group. The attitude of the regular teacher is highly important to the success of special education.

The Exceptional Child

The exceptional child himself offers problems which have been the central theme throughout this book. He is not only a child with a speech defect or with a cardiac condition, but he is the product of many problems which result from his handicap. He not only has to overcome his speech defect but also must overcome the ridicule and ostracism which may have been his lot because of speech defect. If he is a behavior case, he must not only seek to overcome his present behavior trends but also live an exemplary life for a long time so that the finger of suspicion will no longer be pointed at him.

If his defects are very severe, such as total deafness, blindness, or orthopedic disability, he must learn to face a stern reality. In the face of such an outlook he must try to master an education suited to his handicap and seek to become a self-supporting citizen. Mere idle words about his problems as outlined here are nothing as compared to the realities which lie ahead for him.

The proof of success lies in the records of thousands who have benefited by special education and who in adult occupations and in the course of living have met the test. It is sometimes a matter of speculation what changes would occur in the world of today if the nonhandicapped as a group had put as much time and effort accordingly into their education and vocation as the exceptional have been forced to do.

The Public's Attitude

Finally, the attitude of the public is most important if there is to be an adequate program of special education in every community, large or small, rich or poor. This attitude covers a great many kinds of people and affects the handicapped children in many ways. A few of these will be noted.

The parents of exceptional children often need to be educated to the importance of the program for their own children. In the days when they themselves were in school there were few provisions for exceptional children, and hence this is a new and unfamiliar experience to them. Instead of recognizing the program of special education as an opportunity, they occasionally resist and believe that their children have been selected for special punishment on account of school failure and antisocial behavior. The great majority of them accept the special program in the spirit in which it is intended. Any school system which maintains a program of special education has a minimum number of such problems. As the benefits of all types of special classes become evident objections gradually disappear.

The citizen who has no children in special education or no children at all must be helped to realize the significance of such a program. He should accept the principle that all children are entitled to the best education of which they are capable. If some kinds of education costs more than others, it should still be provided at public expense, and the additional cost if pro rated among all children does not perceptibly raise the average educational cost for all children. In many states this additional cost is assumed for some types of the exceptional by state subsidies so that the local communities do not feel it at all. America is the richest nation of the world and can afford to provide the best possible education for all children, including the exceptional.

In the past two or three decades the interest among the recently established service and luncheon clubs in exceptional children has been a most hopeful sign. In many instances the projects by these groups have been directed toward the physical health and general social welfare of exceptional children with the assumption that their educational programs are already adequate. In view of the fact that not more than 10 per cent of the exceptional have special educational provisions the moral support and persuasion of these influential adults for local and state educational support would be welcome also.

The parent-teacher associations and similar groups have also been influential in bringing organized support to the program of education for all children. The movement toward more universal education and better education for all has focused attention upon the needs of the exceptional as well. Living in the present-day world is a complicated task, and educational requirements are being raised higher and higher each year. Service in the armed forces makes much greater requirements upon the average soldier than was formerly true, and even warfare has become one of the most highly technical projects of history.

The Outlook

In this book an attempt has been made to introduce and outline a few of the main problems of exceptional children. It is obvious that they have had many pioneers and champions of their cause. These founders have struggled not only with the defects themselves but with methods of education which needed to be adjusted to the particular defects. Many organizations have been founded—local, national, and international—to aid the program for furtherance of the exceptional and most of them have achieved their primary goals.

It is time to consolidate efforts for all types of exceptional children. Support for the crippled is a worthy cause, but it is no more worthy than for the child with a reading disability, with a feeble mind or with an emotional upset. All efforts must be directed toward unification of a program for all of the exceptional, no matter what their afflictions may be. There is progress when one city has provided for one type of handicapped children and a second city for a second type. The program has passed through its most difficult stages; effort must always be maintained if the maximum is to be realized for exceptional children.

In the introductory chapter four aims of education were listed as self-realization, human relationships, economic efficiency, and civic responsibility. These aims are as worthy for exceptional children as for normal, average children. For both groups it is not a question of worthiness but of an effective program to realize these aims. Self-realization cannot be achieved for the exceptional unless defects are remedied and educational programs suitable to their abilities are made available. Human relationships for the exceptional do not work out satisfactorily unless they are understood at home, in school, and in the community. Many investigations have been cited with regard to deviations of character and personality, particularly in cases where no special educational programs have been offered. The improvement of human relationships is very imperative for exceptional children.

The aims of economic efficiency and civic responsibility likewise will not be realized unless optimum programs both educationally and vocationally are available. Wherever such programs have been established, the exceptional have shown surprisingly good results toward these two important goals. The test of any set of aims and objectives does not lie in how well they are formulated but how well they are put into effect. Such is the challenge of exceptional children.

QUESTIONS AND TOPICS FOR DISCUSSION

1. What does your own community do for its exceptional children? What should you do about it?
2. What is the attitude of the school administration and the teaching staff about these children?
3. What factors are favorable to further progress in special education? What factors are unfavorable?

Appendix

APPENDIX

In Chap. XVIII reference was made to an Appendix in which the details of a plan for the selection of major-work pupils was to be presented. In the Detroit experiment in 1939 all pupils in four elementary schools were rated by this plan and the ratings proved valuable in a better understanding of all children.

GENERAL DIRECTION

A 3 inch by 5 inch card was made for each pupil with ten headings as follows:

Name ______________________________________	Grade ______
	Value
I. General behavior	______
II. Effort as related to ability	______
III. Rating for group intelligence	______
IV. Rating for age, birthday ____ age ____	______
V. Rating for height, height ____ age ____ ratio ____	______
VI. Rating for weight, weight ____ age ____ ratio ____	______
VII. Reading comprehension, grade level ____	______
VIII. Latest scholarship, E ____ S ____ U ____ Total ____	______
IX. Number of permanent teeth, number ____ age ____ ratio ____	______
X. Rating for special activities	______
Total	______

The detailed information is given below.

I. General Behavior

Have the teacher rate each pupil on general behavior. Use five ratings as follows:

Rating	*Value*	*Suggested Per Cent*
Excellent	5	10
Good	4	15
Average	3	50
Poor	2	15
Very poor	1	10

The following suggestions are offered in evaluating behavior:

Value	*Description*
5	Very model behavior, composed, has self-respect, commands respect, considered a worthy leader in school citizenship.
4	Above average, usually quite stable, may have one minor defect, such as unable to control giggling.
3	Average behavior, minor mischief at occasional times, attitudes only fair.
2	Either shy, timid, retiring, weeps readily, nervous or apt to join poor behavior, suggestible, will play for attention, even with poor behavior.
1	Chronic troublemaker, not accepted by the class, has one or two friends of very doubtful behavior.

The suggested per cent is very optional; a teacher might have no "very poor." It is recommended to select first the excellent, second the good, third the very poor, fourth the poor, fifth the average.

After the ratings have been completed, have the teacher enter the score values, such as 5, or 4, and so on, after item number I for general behavior.

II. *Effort as Related to Ability*

Rate each pupil on effort as related to ability.

Use the same terminology and plan as for rating for general behavior. See suggestions below.

Enter these score values, 5, or 4, and so on, after item II.

SUGGESTED SCALE VALUES

5—Has a fine attitude toward study, works up to capacity, generally good in all subjects.

4—Means to do well and generally above average, inclined to rely upon great effort and long hours, rather than general resourcefulness.

3—Average effort, some pupils are variable as to school subjects, tries hard in some, poor in others.

2—Average pupil does fair for grade, but not very good when compared to pupils of same age.

1—Inattentive, discouraged, expects teacher and others to help him. Merely idles time away.

III. Rating for Group Intelligence

Have the latest group mental ratings translated into the following values:

Rating	*Value*
A	5
B	4
C+, C, C−	3
D	2
E	1

Enter these values on line III.

Recording Age, Height, and Weight

From permanent record enter the *month* and *year* of birth, such as 10–28, on the blanks on line IV just after "age." On line V record the latest height, and on line VI the latest weight.

IV. Rating for Age

Convert the month and year of birth from line IV into age in years and month from Table I, such as 10–11, on line IV, just *after* the birth date.

At this point, put all the records of any half-grade, such as 3B, from different sections or rooms together.

Sort all the papers of any half-grade into piles according to the age in years and months. Sort first by years and then by months within each year. Arrange in order from *youngest* to *oldest* for all pupils in a half-grade.

Arrange into five piles according to the following per cents:

	Per Cent	*Rating*
Youngest	10	5
Next youngest	15	4
Middle	50	3
Next oldest	15	2
Oldest	10	1

In Table II the number of cases is shown which should fall into the various percentage groups. For example, if 40 cases are in a group, 4 is 10 per cent, 6 is 15 per cent, 20 is 50 per cent, and so on.

After the youngest 10 per cent of the entire half-grade has been determined, put a rating of "5" on their records on line number IV. In like manner rate the next 15 per cent "4" and record the 4's. Complete the next 50 per cent with ratings of "3," the next 15 per cent with 2's and the oldest 10 per cent with 1's.

V and VI. Rating for Height and Weight

At this point separate the records of boys and girls. Take the boys' records and use Tables III and IV. Convert the height on line V from the body of Table III by reading height years at the top and months at the left, and record it on line number V immediately to the right of the height. (See explanation at top of Table III.)

Consult Table IV for weight in like manner and record on line VI. Be sure to use the correct table, column, and line.

In like manner compute the age, height, and weight for girls, using Tables V and VI.

These ages for height and weight must next be interpreted with respect to each pupil's life age or chronological age as recorded on line number IV.

Use the Inglis' I.Q. book to compute the height and weight ratios by reading the chronological age at the left, while the mental age at the top should be read, first as height age, and then as weight age. Record these ratios, such as a chronological age of 10–0 and a height age of 11–0, as a ratio number of 110 after "ratio" at the right end of line number V. For weight, record the similar ratio at the right end of line number VI.

Reassemble the boys' and girls' records together, then arrange them in order from highest to lowest height ratio from line number V. Divide them into five groups as follows:

	Per Cent	*Rating*
Largest ratios	10	5
Next largest ratios	15	4
Middle ratios	50	3
Next smallest ratios	15	2
Smallest ratios	10	1

Record the ratings 5, 4, and so on, at the end of line number V.

In like manner, rank all the pupils in order of weight ratio from highest to lowest as per line number VI, determine the ratings 5, 4, and so on, and record on line number VI.

VII. Reading Comprehension

After "grade level" on line VII record the latest grade level of reading comprehension, such as 5B. Arrange the pupils in order of grade levels from highest to lowest. Rate as follows:

	Per Cent	*Rating*
Highest	10	5
Next highest	15	4
Middle	50	3
Next lowest	15	2
Lowest	10	1

Record the ratings on line VII.

VIII. Latest Scholarship

On line VIII record the last scholarship marks. Record as follows: 2 E's, 6 S's, 1 U, and compute the scholarship rating. Multiply the number of E's by 3, the S's by 2, and the U's by 1; add the products and record the sum after "total" on line VIII.

Arrange the pupils' records from highest to lowest in terms of scholarship total, using the 10 per cent largest number as 5, the next 15 per cent as 4 as in earlier sections, record the 5's, 4's on line VIII.

IX. Number of Permanent Teeth

Record the number of permanent teeth on line IX.

Consult Table VII for dental ages and record in years and months. Either sort separately for boys and girls or exercise great care in using the proper columns from Table VII.

Use the I.Q. book and proceed as in getting height or weight ratios. Record these ratios on line number IX. Rank them from highest to lowest, divide into the 5 per cent, group with 5's for the highest 10 per cent, and so on. Record these ratings on line IX.

X. Rating for Special Activities

Give a rating for special activities, both from school and home as leader in community activities as per the following suggestions. Use your best judgment in placing pupils who engage in special activities not specifically mentioned below. Rate as 5, 4, etc., on line X.

SUGGESTIONS FOR RATING

5—The Safety Patrol captain, or a leading role in school plays, and one or more others such as unusual in auditorium, member of Safety Patrol.

4—Runner-up to captain, also outstanding in one or more other special activities, unusual in art, writing.

3—In two or more special activities, and considered above average in at least one of them.

2—In one special activity, such as orchestra, special music lesson, Safety Patrol.

1—Not unusual in any fields nor participating in any.

These descriptions apply more specifically to upper grade pupils, but if teachers of lower grades study the general plan noted above, they should be able to make a plan or rating which is similar.

Final Selection

Total the ratings on lines I through X, or on as many lines as are filled out for each pupil. Try to have the same number of lines filled out on all the pupils of a given half-grade.

After the totals have been completed, rank the pupils within each half-grade from highest to lowest in total. Select the highest 5 per cent as being the most gifted within any half-grade as follows:

	Select
Groups of 29 or less	1
Groups from 30 to 49	2
Groups from 50 to 69	3
Groups from 70 to 89	4
Groups from 90 to 109	5

Use your judgment about including one more in the smaller groups and two or three more in the larger enrollments, taking the next ones on the total score.

TABLE I

CHRONOLOGICAL AGES AS OF SEPTEMBER, 1939

(For a birth date of 10–28 read down the 1928 column to the tenth month; the age at the intersection is 10–11).

Month of Birth	*Year of Birth*														
	1921	*1922*	*1923*	*1924*	*1925*	*1926*	*1927*	*1928*	*1929*	*1930*	*1931*	*1932*	*1933*	*1934*	*1935*
1	18–8	17–8	16–8	15–8	14–8	13–8	12–8	11–8	10–8	9–8	8–8	7–8	6–8	5–8	4–8
2	18–7	17–7	16–7	15–7	14–7	13–7	12–7	11–7	10–7	9–7	8–7	7–7	6–7	5–7	4–7
3	18–6	17–6	16–6	15–6	14–6	13–6	12–6	11–6	10–6	9–6	8–6	7–6	6–6	5–6	4–6
4	18–5	17–5	16–5	15–5	14–5	13–5	12–5	11–5	10–5	9–5	8–5	7–5	6–5	5–5	4–5
5	18–4	17–4	16–4	15–4	14–4	13–4	12–4	11–4	10–4	9–4	8–4	7–4	6–4	5–4	4–4
6	18–3	17–3	16–3	15–3	14–3	13–3	12–3	11–3	10–3	9–3	8–3	7–3	6–3	5–3	4–3
7	18–2	17–2	16–2	15–2	14–2	13–2	12–2	11–2	10–2	9–2	8–2	7–2	6–2	5–2	4–2
8	18–1	17–1	16–1	15–1	14–1	13–1	12–1	11–1	10–1	9–1	8–1	7–1	6–1	5–1	4–1
9	18–0	17–0	16–0	15–0	14–0	13–0	12–0	11–0	10–0	9–0	8–0	7–0	6–0	5–0	4–0
10	17–11	16–11	15–11	14–11	13–11	12–11	11–11	10–11	9–11	8–11	7–11	6–11	5–11	4–11	3–11
11	17–10	16–10	15–10	14–10	13–10	12–10	11–10	10–10	9–10	8–10	7–10	6–10	5–10	4–10	3–10
12	17–9	16–9	15–9	14–9	13–9	12–9	11–9	10–9	9–9	8–9	7–9	6–9	5–9	4–9	3–9

TABLE II

NUMBERS FOR PER CENTS AT VARIOUS TOTAL NUMBERS

No. Cases	*10%*	*15%*	*50%*	*15%*	*10%*	*No. Cases*	*10%*	*15%*	*50%*	*15%*	*10%*
11	1	2	5	2	1	56	5	8	28	9	6
12	1	2	6	2	1	57	6	8	28	9	6
13	1	2	7	2	1	58	6	9	29	9	6
14	1	2	7	3	1	59	6	9	29	9	6
15	2	2	7	3	1	60	6	9	30	9	6
16	2	2	8	3	1	61	6	9	30	10	6
17	2	2	8	3	2	62	6	9	31	10	6
18	2	2	9	3	2	63	6	9	31	10	7
19	2	3	9	3	2	64	6	9	32	10	7
20	2	3	10	3	2	65	6	10	32	10	7
21	2	3	10	4	2	66	6	10	33	10	7
22	2	3	11	4	2	67	7	10	33	10	7
23	2	4	11	4	2	68	7	10	34	10	7
24	2	4	12	4	2	69	7	10	34	11	7
25	2	4	12	4	3	70	7	10	35	11	7
26	2	4	13	4	3	71	7	11	35	11	7
27	3	4	13	4	3	72	7	11	36	11	7
28	3	4	14	4	3	73	7	11	36	12	7
29	3	4	14	5	3	74	7	11	37	12	7
30	3	4	15	5	3	75	7	11	37	12	8
31	3	5	15	5	3	76	7	11	38	12	8
32	3	5	16	5	3	77	8	11	38	12	8
33	3	5	16	5	4	78	8	11	39	12	8
34	3	5	17	5	4	79	8	12	39	12	8
35	4	5	17	5	4	80	8	12	40	12	8
36	4	5	18	5	4	81	8	12	40	13	8
37	4	5	18	6	4	82	8	12	41	13	8
38	4	5	19	6	4	83	8	12	41	13	9
39	4	6	19	6	4	84	8	12	42	13	9
40	4	6	20	6	4	85	8	13	42	13	9
41	4	6	20	7	4	86	8	13	43	13	9
42	4	6	21	7	4	87	9	13	43	13	9
43	4	6	21	7	5	88	9	13	44	13	9
44	4	6	22	7	5	89	9	13	44	14	9
45	5	6	22	7	5	90	9	13	45	14	9
46	5	7	23	7	5	91	9	14	45	14	9
47	5	7	23	7	5	92	9	14	46	14	9
48	5	7	24	7	5	93	9	14	46	14	10
49	5	7	24	8	5	94	9	14	47	14	10
50	5	7	25	8	5	95	10	14	47	14	10
51	5	8	25	8	5	96	10	14	48	14	10
52	5	8	26	8	5	97	10	14	48	15	10
53	5	8	26	8	6	98	10	14	49	15	10
54	5	8	27	8	6	99	10	15	49	15	10
55	5	8	27	9	6	100	10	15	50	15	10

TABLE III

HEIGHT AGES FOR BOYS

(After Olson)

(If a boy is 40.5 inches tall, his height of 40.5 is found in the body of the table; years at the top and months at the side; the age if 4 years 5 months, written 4–5.)

Months	*Years*														
	2	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
0	33.8	36.9	39.3	42.0	45.4	47.9	49.7	51.3	53.5	55.2	57.0	59.6	61.9	64.3	66.8
1	34.1	37.2	39.5	42.1	45.6	48.0	49.8	51.4	53.6	55.3	57.2	59.8	62.1	64.5	66.9
2	34.4	37.4	39.8	42.1	45.8	48.2	49.9	51.6	53.8	55.4	57.4	60.0	62.3	64.7	67.0
3	34.6	37.6	40.1	42.2	46.0	48.3	50.1	51.8	53.9	55.6	57.6	60.1	62.5	64.9	67.1
4	34.8	37.9	40.3	42.6	46.2	48.5	50.2	52.0	54.1	55.7	57.8	60.3	62.7	65.1	67.2
5	35.0	38.2	40.5	43.0	46.4	48.6	50.3	52.2	54.2	55.9	58.0	60.5	62.9	65.3	67.3
6	35.2	38.4	40.7	43.3	46.6	48.8	50.5	52.4	54.3	56.1	58.3	60.7	63.1	65.5	67.4
7	35.5	38.6	41.0	43.5	46.8	48.9	50.6	52.6	54.4	56.3	58.5	60.9	63.5	65.7	67.5
8	35.9	38.9	41.3	43.7	47.0	49.1	50.7	52.8	54.5	56.4	58.7	61.1	63.7	65.9	67.6
9	36.2	39.1	41.6	44.0	47.2	49.2	50.9	52.9	54.7	56.5	58.9	61.3	63.9	66.1	67.7
10	36.4	39.2	41.7	44.5	47.4	49.4	51.0	53.1	54.8	56.6	59.2	61.5	64.1	66.3	67.8
11	36.6	39.2	41.8	45.0	47.6	49.5	51.2	53.3	55.0	56.8	59.4	61.7	64.2	66.5	67.9

TABLE IV

WEIGHT AGE FOR BOYS

(After Olson)

Months	*Years*														
	2	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
0	26.3	30.8	34.9	37.9	42.9	50.4	54.4	60.6	65.9	71.9	78.3	88.3	98.1	110.0	121.2
1	26.6	31.1	35.0	38.0	43.5	50.8	54.9	61.0	66.4	72.5	79.1	89.1	99.0	111.0	122.0
2	26.9	31.4	35.1	38.2	44.1	51.1	55.4	61.5	66.9	73.0	80.0	89.9	100.0	112.0	122.8
3	27.2	31.6	35.2	38.4	44.8	51.4	55.9	62.0	67.3	73.5	80.8	90.7	101.0	112.8	123.6
4	27.6	32.0	35.4	38.8	45.5	51.7	56.5	62.4	67.8	74.0	81.7	91.5	102.0	113.6	124.4
5	28.0	32.4	35.6	39.5	46.1	52.1	57.0	62.8	68.3	74.6	82.5	92.3	103.0	114.4	125.2
6	28.4	32.9	35.8	40.2	46.7	52.4	57.5	63.3	68.8	75.1	83.3	93.1	104.0	115.2	126.0
7	28.8	33.2	36.2	40.5	47.3	52.7	58.0	63.8	69.3	75.6	84.1	94.0	105.0	116.2	126.8
8	29.2	33.6	36.7	40.7	48.0	53.0	58.5	64.2	69.8	76.1	84.9	94.8	106.0	117.2	127.6
9	29.6	34.0	37.1	41.0	48.6	53.4	59.0	64.6	70.3	76.7	85.8	95.6	107.0	118.2	128.4
10	30.0	34.3	37.4	41.6	49.2	53.7	59.5	65.0	70.8	77.3	86.6	96.4	108.0	119.2	129.2
11	30.4	34.6	37.7	42.3	49.8	54.1	60.0	65.4	71.4	77.8	87.5	97.2	109.0	120.2	130.0

TABLE V

HEIGHT AGES FOR GIRLS

(After Olson)

Months	*Years*														
	2	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
0	33.0	36.4	39.3	41.7	43.7	47.4	49.1	51.0	53.6	55.5	57.5	59.8	61.8	63.1	63.7
1	33.3	36.7	39.5	41.9	43.9	47.6	49.2	51.3	53.8	55.6	57.6	60.0	61.9		
2	33.7	36.9	39.6	42.0	44.1	47.7	49.4	51.5	53.9	55.8	57.8	60.1	62.0		
3	34.1	37.1	39.8	42.2	44.3	47.9	49.5	51.7	54.1	56.0	58.0	60.3	62.1	63.3	
4	34.4	37.3	40.0	42.3	44.6	48.0	49.7	51.9	54.2	56.1	58.2	60.4	62.3		
5	34.6	37.5	40.2	42.3	44.9	48.2	49.8	52.1	54.3	56.3	58.4	60.6	62.4		
6	34.9	37.8	40.4	42.4	45.3	48.3	50.0	52.3	54.5	56.4	58.6	60.7	62.5	63.4	63.8
7	35.2	38.0	40.7	42.6	45.7	48.5	50.1	52.5	54.7	56.5	58.8	60.9	62.6		
8	35.5	38.3	41.0	42.8	46.0	48.6	50.3	52.7	54.9	56.8	59.0	61.0	62.7		
9	35.7	38.5	41.2	42.9	46.4	48.7	50.5	52.9	55.0	57.0	59.2	61.2	62.8	63.6	
10	35.9	38.7	41.3	43.2	46.7	48.8	50.6	53.1	55.2	57.2	59.4	61.4	62.9		
11	36.2	39.0	41.5	43.4	47.0	49.0	50.8	53.3	55.3	57.3	59.6	61.6	63.0		

TABLE VI

WEIGHT AGE FOR GIRLS

(After Olson)

Months	*Years*														
	2	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
0	24.6	28.8	32.2	36.1	40.3	50.2	53.8	61.2	69.2	75.8	83.7	96.3	106.0	118.0	123.0
1	25.0	29.3	32.6	36.3	41.2	50.5	54.5	61.8	69.7	76.3	84.7	97.1	107.0	118.5	123.1
2	25.4	29.7	33.1	36.6	42.0	50.8	55.1	62.5	70.3	77.1	85.8	97.9	108.0	119.0	123.2
3	25.8	30.2	33.6	36.8	42.8	51.1	55.7	63.1	70.8	77.8	86.8	98.7	109.0	119.5	123.3
4	26.1	30.5	33.7	37.1	43.6	51.4	56.3	63.8	71.4	78.4	87.9	99.5	110.0	120.0	123.4
5	26.5	30.8	33.9	37.3	44.5	51.7	56.9	64.4	71.9	79.0	88.9	100.3	111.0	120.5	123.5
6	26.9	31.0	34.0	37.6	45.3	52.0	57.6	65.1	72.5	79.6	90.0	101.1	112.0	121.0	123.6
7	27.2	31.2	34.5	38.0	46.1	52.3	58.2	65.7	73.0	80.3	91.0	101.9	113.0	121.3	123.7
8	27.6	31.3	35.0	38.5	46.9	52.6	58.8	66.4	73.6	81.0	92.1	102.7	114.0	121.7	123.8
9	27.9	31.5	35.4	38.9	47.7	52.9	59.4	67.1	74.1	81.7	93.1	103.5	115.0	122.0	123.9
10	28.2	31.7	35.6	39.4	47.5	53.2	60.0	67.8	74.7	82.4	94.2	104.3	116.0	122.3	124.0
11	28.5	32.0	35.8	39.8	49.3	53.5	60.6	68.5	75.2	83.0	95.2	105.1	117.0	122.7	124.0

TABLE VII

DENTAL AGE EQUIVALENTS FOR THE ERUPTION OF PERMANENT TEETH

No. of Teeth	*Boys Dental Age*	*Girls Dental Age*
1	5–10	5–9
2	6–1	5–11
3	6–4	6–1
4	6–6	6–2
5	6–9	6–5
6	6–11	6–8
7	7–1	6–11
8	7–4	7–2
9	7–8	7–5
10	8–0	7–8
11	8–5	8–1
12	8–11	8–7
13	9–5	9–0
14	9–10	9–4
15	10–2	9–8
16	10–5	9–10
17	10–7	10–1
18	10–11	10–3
19	11–2	10–6
20	11–4	10–8
21	11–6	10–10
22	11–7	11–1
23	11–9	11–4
24	11–11	11–6
25	12–2	11–9
26	12–6	12–1
27	13–0	12–8
28	13–3	12–9

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★ CALCUTTA-27 ★